

**D<sup>0</sup>**

$$I(J^P) = \frac{1}{2}(0^-)$$

## **D<sup>0</sup> MASS**

The fit includes  $D^\pm$ ,  $D^0$ ,  $D_s^\pm$ ,  $D^{*\pm}$ ,  $D^{*0}$ , and  $D_s^{*\pm}$  mass and mass difference measurements.

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>1864.84 ± 0.17 OUR FIT</b>		Error includes scale factor of 1.1.		
<b>1864.84 ± 0.18 OUR AVERAGE</b>				
1864.847 ± 0.150 ± 0.095	319 ± 18	CAWLFIELD 07	CLEO $D^0 \rightarrow K_S^0 \phi$	■
1864.6 ± 0.3 ± 1.0	641	BARLAG 90C	ACCM $\pi^-$ Cu 230 GeV	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1852 ± 7	16	ADAMOVICH 87	EMUL Photoproduction	
1856 ± 36	22	ADAMOVICH 84B	EMUL Photoproduction	
1861 ± 4		DERRICK 84	HRS $e^+ e^-$ 29 GeV	
1847 ± 7	1	FIORINO 81	EMUL $\gamma N \rightarrow \bar{D}^0 +$	
1863.8 ± 0.5		<sup>1</sup> SCHINDLER 81	MRK2 $e^+ e^-$ 3.77 GeV	
1864.7 ± 0.6		<sup>1</sup> TRILLING 81	RVUE $e^+ e^-$ 3.77 GeV	
1863.0 ± 2.5	238	ASTON 80E	OMEG $\gamma p \rightarrow \bar{D}^0$	
1860 ± 2	143	<sup>2</sup> AVERY 80	SPEC $\gamma N \rightarrow D^{*+}$	
1869 ± 4	35	<sup>2</sup> AVERY 80	SPEC $\gamma N \rightarrow D^{*+}$	
1854 ± 6	94	<sup>2</sup> ATIYA 79	SPEC $\gamma N \rightarrow D^0 \bar{D}^0$	
1850 ± 15	64	BALTAY 78C	HBC $\nu N \rightarrow K^0 \pi\pi$	
1863 ± 3		GOLDHABER 77	MRK1 $D^0, D^+$ recoil spectra	
1863.3 ± 0.9		<sup>1</sup> PERUZZI 77	MRK1 $e^+ e^-$ 3.77 GeV	
1868 ± 11		PICCOLO 77	MRK1 $e^+ e^-$ 4.03, 4.41 GeV	
1865 ± 15	234	GOLDHABER 76	MRK1 $K\pi$ and $K3\pi$	

<sup>1</sup> PERUZZI 77 and SCHINDLER 81 errors do not include the 0.13% uncertainty in the absolute SPEAR energy calibration. TRILLING 81 uses the high precision  $J/\psi(1S)$  and  $\psi(2S)$  measurements of ZHOLENTZ 80 to determine this uncertainty and combines the PERUZZI 77 and SCHINDLER 81 results to obtain the value quoted. TRILLING 81 enters the fit in the  $D^\pm$  mass, and PERUZZI 77 and SCHINDLER 81 enter in the  $m_{D^\pm} - m_{D^0}$ , below.

<sup>2</sup> Error does not include possible systematic mass scale shift, estimated to be less than 5 MeV.

## **$m_{D^\pm} - m_{D^0}$**

The fit includes  $D^\pm$ ,  $D^0$ ,  $D_s^\pm$ ,  $D^{*\pm}$ ,  $D^{*0}$ , and  $D_s^{*\pm}$  mass and mass difference measurements.

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
<b>4.78±0.10 OUR FIT</b>	Error includes scale factor of 1.1.		
<b>4.74±0.28 OUR AVERAGE</b>			
4.7 ± 0.3	<sup>3</sup> SCHINDLER 81	MRK2 $e^+ e^-$ 3.77 GeV	
5.0 ± 0.8	<sup>3</sup> PERUZZI 77	MRK1 $e^+ e^-$ 3.77 GeV	

<sup>3</sup> See the footnote on TRILLING 81 in the  $D^0$  and  $D^\pm$  sections on the mass.

## $D^0$ MEAN LIFE

Measurements with an error  $> 10 \times 10^{-15}$  s have been omitted from the average.

VALUE ( $10^{-15}$ s)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>40.1 ± 1.5 OUR AVERAGE</b>				
409.6 ± 1.1 ± 1.5	210k	LINK	02F	FOCS $\gamma$ nucleus, $\approx 180$ GeV
407.9 ± 6.0 ± 4.3	10k	KUSHNIR...	01	SELX $K^- \pi^+$ , $K^- \pi^+ \pi^+ \pi^-$
413 ± 3 ± 4	35k	AITALA	99E	E791 $K^- \pi^+$
408.5 ± 4.1 ± 3.5	25k	BONVICINI	99	CLE2 $e^+ e^- \approx \gamma(4S)$
413 ± 4 ± 3	16k	FABRETTI	94D	E687 $K^- \pi^+$ , $K^- \pi^+ \pi^+ \pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
424 ± 11 ± 7	5118	FABRETTI	91	E687 $K^- \pi^+$ , $K^- \pi^+ \pi^+ \pi^-$
417 ± 18 ± 15	890	ALVAREZ	90	NA14 $K^- \pi^+$ , $K^- \pi^+ \pi^+ \pi^-$
388 ± 23 -21	641	<sup>4</sup> BARLAG	90C	ACCM $\pi^-$ Cu 230 GeV
480 ± 40 ± 30	776	ALBRECHT	88I	ARG $e^+ e^-$ 10 GeV
422 ± 8 ± 10	4212	RAAB	88	E691 Photoproduction
420 ± 50	90	BARLAG	87B	ACCM $K^-$ and $\pi^-$ 200 GeV

<sup>4</sup> BARLAG 90C estimate systematic error to be negligible.

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$$|m_{D_1^0} - m_{D_2^0}|$$

The  $D_1^0$  and  $D_2^0$  are the mass eigenstates of the  $D^0$  meson, as described in the note on “ $D^0$ - $\bar{D}^0$  Mixing,” above.

VALUE ( $10^{10}$ $\text{n s}^{-1}$ )	CL%	DOCUMENT ID	TECN	COMMENT
< 7	95	<sup>5</sup> ZHANG	06	BELL $e^+ e^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
-11 to +22		<sup>6</sup> ASNER	05	CLEO $e^+ e^- \approx 10$ GeV
< 11	90	BITENC	05	BELL
< 30	90	CAWLFIELD	05	CLEO
< 7	95	<sup>5</sup> LI	05A	BELL See ZHANG 06
< 22	95	<sup>7</sup> LINK	05H	FOCS $\gamma$ nucleus
< 23	95	AUBERT	04Q	BABR
< 11	95	<sup>5</sup> AUBERT	03Z	BABR $e^+ e^-$ , 10.6 GeV
< 7	95	<sup>8</sup> GODANG	00	CLE2 $e^+ e^-$
< 32	90	<sup>9,10</sup> AITALA	98	E791 $\pi^-$ nucleus, 500 GeV
< 24	90	<sup>11</sup> AITALA	96C	E791 $\pi^-$ nucleus, 500 GeV
< 21	90	<sup>10,12</sup> ANJOS	88C	E691 Photoproduction

- <sup>5</sup> The AUBERT 03Z, LI 05A, and ZHANG 06 limits are inferred from the  $D^0$ - $\bar{D}^0$  mixing ratio  $\Gamma(K^+\pi^- \text{ (via } \bar{D}^0\text{)})/\Gamma(K^-\pi^+)$  given near the end of this  $D^0$  Listings. Decay-time information is used to distinguish DCS decays from  $D^0$ - $\bar{D}^0$  mixing. The limit allows interference between the DCS and mixing ratios, and also allows  $CP$  violation. AUBERT 03Z assumes the strong phase between  $D^0 \rightarrow K^+\pi^-$  and  $\bar{D}^0 \rightarrow K^+\pi^-$  amplitudes is small; if an arbitrary phase is allowed, the limit degrades by 20%. The LI 05A and ZHANG 06 limits are valid for an arbitrary strong phase.
- <sup>6</sup> This ASNER 05 limit is from the time-dependent Dalitz-plot analysis of  $D^0 \rightarrow K_S^0\pi^+\pi^-$ . Decay-time information and interference on the Dalitz plot are used to distinguish doubly Cabibbo-suppressed decays from mixing and to measure the relative phase between  $D^0 \rightarrow K^*\pi^-$  and  $\bar{D}^0 \rightarrow K^*\pi^-$ . This limit allows  $CP$  violation and is sensitive to the sign of  $\Delta m$ .
- <sup>7</sup> This LINK 05H limit is inferred from the  $D^0$ - $\bar{D}^0$  mixing ratio  $\Gamma(K^+\pi^- \text{ (via } \bar{D}^0\text{)})/\Gamma(K^-\pi^+)$  given near the end of this  $D^0$  Listings. Decay-time information is used to distinguish DCS decays from  $D^0$ - $\bar{D}^0$  mixing. The limit allows interference between the DCS and mixing ratios, and also allows  $CP$  violation. The strong phase between  $D^0 \rightarrow K^+\pi^-$  and  $\bar{D}^0 \rightarrow K^+\pi^-$  is assumed to be small. If an arbitrary relative strong phase is allowed, the limit degrades by 25%.
- <sup>8</sup> This GODANG 00 limit is inferred from the  $D^0$ - $\bar{D}^0$  mixing ratio  $\Gamma(K^+\pi^- \text{ (via } \bar{D}^0\text{)})/\Gamma(K^-\pi^+)$  given near the end of this  $D^0$  Listings. Decay-time information is used to distinguish DCS decays from  $D^0$ - $\bar{D}^0$  mixing. The limit allows interference between the DCS and mixing ratios, and also allows  $CP$  violation. The strong phase between  $D^0 \rightarrow K^+\pi^-$  and  $\bar{D}^0 \rightarrow K^+\pi^-$  is assumed to be small. If an arbitrary relative strong phase is allowed, the limit degrades by a factor of two.
- <sup>9</sup> AITALA 98 allows interference between the doubly Cabibbo-suppressed and mixing amplitudes, and also allows  $CP$  violation in this term, but assumes that  $A_D = A_R = 0$ . See the note on " $D^0$ - $\bar{D}^0$  Mixing," above.
- <sup>10</sup> This limit is inferred from  $R_M$  for  $f = K^+\pi^-$  and  $f = K^+\pi^-\pi^+\pi^-$ . See the note on " $D^0$ - $\bar{D}^0$  Mixing," above. Decay-time information is used to distinguish doubly Cabibbo-suppressed decays from  $D^0$ - $\bar{D}^0$  mixing.
- <sup>11</sup> This limit is inferred from  $R_M$  for  $f = K^+\ell^-\bar{\nu}_\ell$ . See the note on " $D^0$ - $\bar{D}^0$  Mixing," above.
- <sup>12</sup> ANJOS 88C assumes that  $y = 0$ . See the note on " $D^0$ - $\bar{D}^0$  Mixing," above. Without this assumption, the limit degrades by about a factor of two.

$$(\Gamma_{D_1^0} - \Gamma_{D_2^0})/\Gamma = 2y$$

The  $D_1^0$  and  $D_2^0$  are the mass eigenstates of the  $D^0$  meson, as described in the note on " $D^0$ - $\bar{D}^0$  Mixing," above.

VALUE (units $10^{-2}$ )	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
<b>1.4 ± 1.0 OUR AVERAGE</b>					
-3.0 + 5.0 - 4.8 - 0.8	+1.6		13 ASNER	05 CLEO	$e^+e^- \approx 10 \text{ GeV}$
1.6 ± 0.8 - 0.8	+1.0	450k	14 AUBERT	03P BABR	$e^+e^- \approx \Upsilon(4S)$
-1.0 ± 2.0 - 1.6	+1.4	18k	15 ABE	02I BELL	$e^+e^- \approx \Upsilon(4S)$
-2.4 ± 5.0 6.84 ± 2.78 ± 1.48	+2.8	3393 10k	16 CSORNA 15 LINK	02 CLE2 00 FOCS	$e^+e^- \approx \Upsilon(4S)$ $\gamma$ nucleus
+1.6 ± 5.8 - 2.1	±2.1		15 AITALA	99E E791	$K^-\pi^+, K^+K^-$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$-0.7 \pm 4.9$	$4k \pm 88$	<sup>17,18</sup> ZHANG	06 BELL	$e^+ e^-$
$-0.3 \pm 5.7$		<sup>17,18</sup> LI	05A BELL	See ZHANG 06
$-5.2^{+18.4}_{-16.8}$		<sup>17,18</sup> LINK	05H FOCS	$\gamma$ nucleus
$1.6^{+6.2}_{-12.8}$		<sup>17,18</sup> AUBERT	03Z BABR	$e^+ e^-$ , 10.6 GeV
$-5.0^{+2.8}_{-3.2} \pm 0.6$		<sup>18</sup> GODANG	00 CLE2	$e^+ e^-$
$ \Delta\Gamma /\Gamma < 26$	90	<sup>19,20</sup> AITALA	98 E791	$\pi^-$ nucleus, 500 GeV
$ \Delta\Gamma /\Gamma < 20$	90	<sup>21</sup> AITALA	96C E791	$\pi^-$ nucleus, 500 GeV
$ \Delta\Gamma /\Gamma < 17$	90	<sup>20,22</sup> ANJOS	88C E691	Photoproduction

<sup>13</sup>This ASNER 05 limit is from the time-dependent Dalitz-plot analysis of  $D^0 \rightarrow K_S^0 \pi^+ \pi^-$ . Decay-time information and interference on the Dalitz plot are used to distinguish doubly Cabibbo-suppressed decays from mixing and to measure the relative phase between  $D^0 \rightarrow K^+ \pi^-$  and  $\bar{D}^0 \rightarrow K^+ \pi^-$ . This limit allows  $CP$  violation.

<sup>14</sup>AUBERT 03P measures  $Y \equiv 2\tau^0 / (\tau^+ + \tau^-) - 1$ , where  $\tau^0$  is the  $D^0 \rightarrow K^- \pi^+$  (and  $\bar{D}^0 \rightarrow K^+ \pi^-$ ) lifetime, and  $\tau^+$  and  $\tau^-$  are the  $D^0$  and  $\bar{D}^0$  lifetimes to  $CP$ -even states (here  $K^- K^+$  and  $\pi^- \pi^+$ ). In the limit of  $CP$  conservation,  $Y = y \equiv \Delta\Gamma / 2\Gamma$  (we list  $2y = \Delta\Gamma/\Gamma$ ). AUBERT 03P also uses  $\tau^+ - \tau^-$  to get  $\Delta Y = -0.008 \pm 0.006 \pm 0.002$ .

<sup>15</sup>LINK 00, AITALA 99E, and ABE 02I measure the lifetime difference between  $D^0 \rightarrow K^- K^+$  ( $CP$  even) decays and  $D^0 \rightarrow K^- \pi^+$  ( $CP$  mixed) decays, or  $y_{CP} = [\Gamma(CP+) - \Gamma(CP-)] / [\Gamma(CP+) + \Gamma(CP-)]$ . We list  $2y_{CP} = \Delta\Gamma/\Gamma$ .

<sup>16</sup>CSORNA 02 measures the lifetime difference between  $D^0 \rightarrow K^- K^+$  and  $\pi^- \pi^+$  ( $CP$  even) decays and  $D^0 \rightarrow K^- \pi^+$  ( $CP$  mixed) decays, or  $y_{CP} = [\Gamma(CP+) - \Gamma(CP-)] / [\Gamma(CP+) + \Gamma(CP-)]$ . We list  $2y_{CP} = \Delta\Gamma/\Gamma$ .

<sup>17</sup>The ranges of AUBERT 03Z, LINK 05H, LI 05A, and ZHANG 06 measurements are for 95% confidence level.

<sup>18</sup>The GODANG 00, AUBERT 03Z, LINK 05H, LI 05A, and ZHANG 06 limits are inferred from the  $D^0$ - $\bar{D}^0$  mixing ratio  $\Gamma(K^+ \pi^-)$  (via  $\bar{D}^0$ )/ $\Gamma(K^- \pi^+)$  given near the end of this  $D^0$  Listings. Decay-time information is used to distinguish DCS decays from  $D^0$ - $\bar{D}^0$  mixing. The limit allows interference between the DCS and mixing ratios, and also allows  $CP$  violation. The phase between  $D^0 \rightarrow K^+ \pi^-$  and  $\bar{D}^0 \rightarrow K^+ \pi^-$  is assumed to be small. This is a measurement of  $y'$  and is not the same as the  $y_{CP}$  of our note above on "D<sup>0</sup>-D̄<sup>0</sup> Mixing."

<sup>19</sup>AITALA 98 allows interference between the doubly Cabibbo-suppressed and mixing amplitudes, and also allows  $CP$  violation in this term, but assumes that  $A_D = A_R = 0$ . See the note on "D<sup>0</sup>-D̄<sup>0</sup> Mixing," above.

<sup>20</sup>This limit is inferred from  $R_M$  for  $f = K^+ \pi^-$  and  $f = K^+ \pi^- \pi^+ \pi^-$ . See the note on "D<sup>0</sup>-D̄<sup>0</sup> Mixing," above. Decay-time information is used to distinguish doubly Cabibbo-suppressed decays from  $D^0$ - $\bar{D}^0$  mixing.

<sup>21</sup>This limit is inferred from  $R_M$  for  $f = K^+ \ell^- \bar{\nu}_\ell$ . See the note on "D<sup>0</sup>-D̄<sup>0</sup> Mixing," above.

<sup>22</sup>ANJOS 88C assumes that  $y = 0$ . See the note on "D<sup>0</sup>-D̄<sup>0</sup> Mixing," above. Without this assumption, the limit degrades by about a factor of two.

## **$D^0$ DECAY MODES**

Most decay modes (other than the semileptonic modes) that involve a neutral  $K$  meson are now given as  $K_S^0$  modes, not as  $\bar{K}^0$  modes. Nearly always it is a  $K_S^0$  that is measured, and interference between Cabibbo-allowed and doubly Cabibbo-suppressed modes can invalidate the assumption that  $2\Gamma(K_S^0) = \Gamma(\bar{K}^0)$ .

Mode	Fraction ( $\Gamma_i/\Gamma$ )	Scale factor/ Confidence level
<b>Topological modes</b>		
$\Gamma_1$ 0-prongs	[a] (19 $\pm$ 6) %	
$\Gamma_2$ 2-prongs	(67 $\pm$ 6) %	
$\Gamma_3$ 4-prongs	[b] (13.8 $\pm$ 0.5) %	
$\Gamma_4$ 6-prongs	( 1.2 $\pm$ 1.3 ) $\times 10^{-3}$	
<b>Inclusive modes</b>		
$\Gamma_5$ $e^+$ anything	[c] ( 6.55 $\pm$ 0.17 ) %	
$\Gamma_6$ $\mu^+$ anything	( 6.6 $\pm$ 0.6 ) %	
$\Gamma_7$ $K^-$ anything	(53 $\pm$ 4) %	S=1.3
$\Gamma_8$ $\bar{K}^0$ anything + $K^0$ anything	(47 $\pm$ 4) %	
$\Gamma_9$ $K^+$ anything	( 3.4 $\pm$ 0.6 ) %	
$\Gamma_{10}$ $K^*(892)^-$ anything	(15 $\pm$ 9) %	
$\Gamma_{11}$ $\bar{K}^*(892)^0$ anything	( 9 $\pm$ 4 ) %	
$\Gamma_{12}$ $K^*(892)^+$ anything	< 3.6 %	CL=90%
$\Gamma_{13}$ $K^*(892)^0$ anything	( 2.8 $\pm$ 1.3 ) %	
$\Gamma_{14}$ $\eta$ anything	( 9.5 $\pm$ 0.9 ) %	
$\Gamma_{15}$ $\eta'$ anything	( 2.48 $\pm$ 0.27 ) %	
$\Gamma_{16}$ $\phi$ anything	( 1.05 $\pm$ 0.11 ) %	
<b>Semileptonic modes</b>		
$\Gamma_{17}$ $K^- \ell^+ \nu_\ell$		
$\Gamma_{18}$ $K^- e^+ \nu_e$	( 3.50 $\pm$ 0.09 ) %	
$\Gamma_{19}$ $K^- \mu^+ \nu_\mu$	( 3.27 $\pm$ 0.13 ) %	
$\Gamma_{20}$ $K^*(892)^- e^+ \nu_e$	( 2.16 $\pm$ 0.16 ) %	
$\Gamma_{21}$ $K^*(892)^- \mu^+ \nu_\mu$	( 1.94 $\pm$ 0.25 ) %	
$\Gamma_{22}$ $K^- \pi^0 e^+ \nu_e$		
$\Gamma_{23}$ $\bar{K}^0 \pi^- e^+ \nu_e$	( 2.7 $\pm$ 0.9 ) %	
$\Gamma_{24}$ $\bar{K}^0 \pi^- \mu^+ \nu_\mu$		
$\Gamma_{25}$ $K^*(892)^- \ell^+ \nu_\ell$		
$\Gamma_{26}$ $\bar{K}^*(892)^0 \pi^- e^+ \nu_e$		
$\Gamma_{27}$ $K^- \pi^+ \pi^- \mu^+ \nu_\mu$	< 1.2 $\times 10^{-3}$	CL=90%

$\Gamma_{28}$	$(\bar{K}^*(892)\pi)^-\mu^+\nu_\mu$	< 1.4	$\times 10^{-3}$	CL=90%
$\Gamma_{29}$	$\pi^-e^+\nu_e$	( 2.80 $\pm$ 0.17 )	$\times 10^{-3}$	
$\Gamma_{30}$	$\pi^-\mu^+\nu_\mu$	( 2.36 $\pm$ 0.24 )	$\times 10^{-3}$	
$\Gamma_{31}$	$\rho^-e^+\nu_e$	( 1.9 $\pm$ 0.4 )	$\times 10^{-3}$	

**Hadronic modes with one  $\bar{K}$** 

$\Gamma_{32}$	$K^-\pi^+$	( 3.82 $\pm$ 0.07 )	%	S=1.1
$\Gamma_{33}$	$K_S^0\pi^0$	( 1.13 $\pm$ 0.12 )	%	
$\Gamma_{34}$	$K_S^0\pi^+\pi^-$	[d] ( 2.88 $\pm$ 0.19 )	%	
$\Gamma_{35}$	$K_S^0\rho^0$	( 7.5 $\pm$ 0.6 )	$\times 10^{-3}$	
$\Gamma_{36}$	$K_S^0\omega, \omega \rightarrow \pi^+\pi^-$	( 2.1 $\pm$ 0.6 )	$\times 10^{-4}$	
$\Gamma_{37}$	$K_S^0f_0(980),$ $f_0(980) \rightarrow \pi^+\pi^-$	( 1.35 $\pm$ 0.30 )	$\times 10^{-3}$	
$\Gamma_{38}$	$K_S^0f_2(1270),$ $f_2(1270) \rightarrow \pi^+\pi^-$	( 1.3 $\pm$ 1.1 )	$\times 10^{-4}$	
$\Gamma_{39}$	$K_S^0f_0(1370),$ $f_0(1370) \rightarrow \pi^+\pi^-$	( 2.5 $\pm$ 0.6 )	$\times 10^{-3}$	
$\Gamma_{40}$	$K^*(892)^-\pi^+,$ $K^*(892)^- \rightarrow K_S^0\pi^-$	( 1.90 $\pm$ 0.14 )	%	
$\Gamma_{41}$	$K^*(892)^+\pi^-,$ $K^*(892)^+ \rightarrow K_S^0\pi^+$	[e] ( 10 $\pm$ 12 )	$\times 10^{-5}$	
$\Gamma_{42}$	$K_0^*(1430)^-\pi^+,$ $K_0^*(1430)^- \rightarrow K_S^0\pi^-$	( 2.8 $\pm$ 0.6 )	$\times 10^{-3}$	
$\Gamma_{43}$	$K_2^*(1430)^-\pi^+,$ $K_2^*(1430)^- \rightarrow K_S^0\pi^-$	( 3.2 $\pm$ 2.1 )	$\times 10^{-4}$	
$\Gamma_{44}$	$K^*(1680)^-\pi^+,$ $K^*(1680)^- \rightarrow K_S^0\pi^-$	( 6 $\pm$ 5 )	$\times 10^{-4}$	
$\Gamma_{45}$	$K_S^0\pi^+\pi^-$ nonresonant	( 2.6 $\pm$ 5.9 )	$\times 10^{-4}$	
$\Gamma_{46}$	$K^-\pi^+\pi^0$	[d] ( 13.5 $\pm$ 0.6 )	%	S=1.6
$\Gamma_{47}$	$K^-\rho^+$	( 10.5 $\pm$ 0.7 )	%	
$\Gamma_{48}$	$K^-\rho(1700)^+,$ $\rho(1700)^+ \rightarrow \pi^+\pi^0$	( 7.7 $\pm$ 1.7 )	$\times 10^{-3}$	
$\Gamma_{49}$	$K^*(892)^-\pi^+,$ $K^*(892)^- \rightarrow K^-\pi^0$	( 2.16 $\pm$ 0.35 )	%	
$\Gamma_{50}$	$\bar{K}^*(892)^0\pi^0,$ $\bar{K}^*(892)^0 \rightarrow K^-\pi^+$	( 1.83 $\pm$ 0.23 )	%	
$\Gamma_{51}$	$K_0^*(1430)^-\pi^+,$ $K_0^*(1430)^- \rightarrow K^-\pi^0$	( 4.5 $\pm$ 2.1 )	$\times 10^{-3}$	

$\Gamma_{52}$	$\overline{K}_0^*(1430)^0 \pi^0,$ $\overline{K}_0^*(1430)^0 \rightarrow K^- \pi^+$	$(5.5 \pm 4.4) \times 10^{-3}$
$\Gamma_{53}$	$K^*(1680)^- \pi^+,$ $K^*(1680)^- \rightarrow K^- \pi^0$	$(1.8 \pm 0.7) \times 10^{-3}$
$\Gamma_{54}$	$K^- \pi^+ \pi^0$ nonresonant	$(1.08 \pm 0.52) \%$
$\Gamma_{55}$	$K_S^0 \pi^0 \pi^0$	—
$\Gamma_{56}$	$\overline{K}^*(892)^0 \pi^0,$ $\overline{K}^*(892)^0 \rightarrow K_S^0 \pi^0$	$(6.2 \pm 1.8) \times 10^{-3}$
$\Gamma_{57}$	$K_S^0 \pi^0 \pi^0$ nonresonant	$(4.2 \pm 1.1) \times 10^{-3}$
$\Gamma_{58}$	$K^- \pi^+ \pi^+ \pi^-$	[d] $(7.70 \pm 0.25) \%$ S=1.2
$\Gamma_{59}$	$K^- \pi^+ \rho^0$ total	$(6.43 \pm 0.34) \%$
$\Gamma_{60}$	$K^- \pi^+ \rho^0$ 3-body	$(4.9 \pm 2.2) \times 10^{-3}$
$\Gamma_{61}$	$\overline{K}^*(892)^0 \rho^0,$ $\overline{K}^*(892)^0 \rightarrow K^- \pi^+$	$(1.00 \pm 0.22) \%$
$\Gamma_{62}$	$K^- a_1(1260)^+,$ $a_1(1260)^+ \rightarrow \pi^+ \pi^+ \pi^-$	$(3.6 \pm 0.6) \%$
$\Gamma_{63}$	$\overline{K}^*(892)^0 \pi^+ \pi^-$ total, $\overline{K}^*(892)^0 \rightarrow K^- \pi^+$	$(1.5 \pm 0.4) \%$
$\Gamma_{64}$	$\overline{K}^*(892)^0 \pi^+ \pi^-$ 3-body, $\overline{K}^*(892)^0 \rightarrow K^- \pi^+$	$(9.7 \pm 2.1) \times 10^{-3}$
$\Gamma_{65}$	$K_1(1270)^- \pi^+,$ $K_1(1270)^- \rightarrow K^- \pi^+ \pi^-$	[f] $(2.9 \pm 0.3) \times 10^{-3}$
$\Gamma_{66}$	$K^- \pi^+ \pi^+ \pi^-$ nonresonant	$(1.79 \pm 0.25) \%$
$\Gamma_{67}$	$K_S^0 \pi^+ \pi^- \pi^0$	[d] $(5.3 \pm 0.6) \%$
$\Gamma_{68}$	$K_S^0 \eta, \eta \rightarrow \pi^+ \pi^- \pi^0$	$(8.6 \pm 1.4) \times 10^{-4}$
$\Gamma_{69}$	$K_S^0 \omega, \omega \rightarrow \pi^+ \pi^- \pi^0$	$(9.8 \pm 1.8) \times 10^{-3}$
$\Gamma_{70}$	$K^*(892)^- \rho^+,$ $K^*(892)^- \rightarrow K_S^0 \pi^-$	$(2.1 \pm 0.8) \%$
$\Gamma_{71}$	$K_1(1270)^- \pi^+,$ $K_1(1270)^- \rightarrow K_S^0 \pi^- \pi^0$	[f] $(2.2 \pm 0.6) \times 10^{-3}$
$\Gamma_{72}$	$\overline{K}^*(892)^0 \pi^+ \pi^-$ 3-body, $\overline{K}^*(892)^0 \rightarrow K_S^0 \pi^0$	$(2.4 \pm 0.5) \times 10^{-3}$
$\Gamma_{73}$	$K_S^0 \pi^+ \pi^- \pi^0$ nonresonant	$(1.1 \pm 1.1) \%$
$\Gamma_{74}$	$K^- \pi^+ \pi^0 \pi^0$	
$\Gamma_{75}$	$K^- \pi^+ \pi^+ \pi^- \pi^0$	$(4.1 \pm 0.4) \%$
$\Gamma_{76}$	$\overline{K}^*(892)^0 \pi^+ \pi^- \pi^0,$ $\overline{K}^*(892)^0 \rightarrow K^- \pi^+$	$(1.2 \pm 0.6) \%$
$\Gamma_{77}$	$K^- \pi^+ \omega, \omega \rightarrow \pi^+ \pi^- \pi^0$	$(2.7 \pm 0.5) \%$
$\Gamma_{78}$	$\overline{K}^*(892)^0 \omega,$ $\overline{K}^*(892)^0 \rightarrow K^- \pi^+,$ $\omega \rightarrow \pi^+ \pi^- \pi^0$	$(6.5 \pm 2.4) \times 10^{-3}$
$\Gamma_{79}$	$K_S^0 \eta \pi^0$	$(5.2 \pm 1.2) \times 10^{-3}$

$\Gamma_{80}$	$K_S^0 a_0(980)$ , $a_0(980) \rightarrow \eta \pi^0$	$(6.2 \pm 2.0) \times 10^{-3}$
$\Gamma_{81}$	$\bar{K}^*(892)^0 \eta$ , $\bar{K}^*(892)^0 \rightarrow K_S^0 \pi^0$	$(1.5 \pm 0.5) \times 10^{-3}$
$\Gamma_{82}$	$K_S^0 2\pi^+ 2\pi^-$	$(2.74 \pm 0.31) \times 10^{-3}$
$\Gamma_{83}$	$K_S^0 \rho^0 \pi^+ \pi^-$ , no $K^*(892)^-$	$(1.1 \pm 0.7) \times 10^{-3}$
$\Gamma_{84}$	$K^*(892)^- \pi^+ \pi^+ \pi^-$ , $K^*(892)^- \rightarrow K_S^0 \pi^-$ , no $\rho^0$	$(5 \pm 8) \times 10^{-4}$
$\Gamma_{85}$	$K^*(892)^- \rho^0 \pi^+$ , $K^*(892)^- \rightarrow K_S^0 \pi^-$	$(1.6 \pm 0.7) \times 10^{-3}$
$\Gamma_{86}$	$K_S^0 2\pi^+ 2\pi^-$ nonresonant	$< 1.3 \times 10^{-3}$ CL=90%
$\Gamma_{87}$	$\bar{K}^0 \pi^+ \pi^- \pi^0 (\pi^0)$	
$\Gamma_{88}$	$K^- 3\pi^+ 2\pi^-$	$(2.1 \pm 0.5) \times 10^{-4}$

Fractions of many of the following modes with resonances have already appeared above as submodes of particular charged-particle modes. (Modes for which there are only upper limits and  $\bar{K}^*(892)\rho$  submodes only appear below.)

$\Gamma_{89}$	$K_S^0 \eta$	$(3.8 \pm 0.6) \times 10^{-3}$
$\Gamma_{90}$	$K_S^0 \omega$	$(1.09 \pm 0.19) \%$
$\Gamma_{91}$	$K_S^0 \eta'(958)$	$(9.1 \pm 1.4) \times 10^{-3}$
$\Gamma_{92}$	$K^- a_1(1260)^+$	$(7.5 \pm 1.1) \%$
$\Gamma_{93}$	$\bar{K}^0 a_1(1260)^0$	$< 1.9 \%$ CL=90%
$\Gamma_{94}$	$K^- a_2(1320)^+$	$< 2 \times 10^{-3}$ CL=90%
$\Gamma_{95}$	$\bar{K}^*(892)^0 \pi^+ \pi^-$ total	$(2.3 \pm 0.5) \%$
$\Gamma_{96}$	$\bar{K}^*(892)^0 \pi^+ \pi^-$ 3-body	$(1.46 \pm 0.33) \%$
$\Gamma_{97}$	$\bar{K}^*(892)^0 \rho^0$	$(1.50 \pm 0.33) \%$
$\Gamma_{98}$	$\bar{K}^*(892)^0 \rho^0$ transverse	$(1.6 \pm 0.5) \%$
$\Gamma_{99}$	$\bar{K}^*(892)^0 \rho^0$ S-wave	$(2.9 \pm 0.6) \%$
$\Gamma_{100}$	$\bar{K}^*(892)^0 \rho^0$ S-wave long.	$< 3 \times 10^{-3}$ CL=90%
$\Gamma_{101}$	$\bar{K}^*(892)^0 \rho^0$ P-wave	$< 3 \times 10^{-3}$ CL=90%
$\Gamma_{102}$	$\bar{K}^*(892)^0 \rho^0$ D-wave	$(2.0 \pm 0.6) \%$
$\Gamma_{103}$	$K^*(892)^- \rho^+$	$(6.4 \pm 2.5) \%$
$\Gamma_{104}$	$K^*(892)^- \rho^+$ longitudinal	$(3.1 \pm 1.2) \%$
$\Gamma_{105}$	$K^*(892)^- \rho^+$ transverse	$(3.3 \pm 1.9) \%$
$\Gamma_{106}$	$K^*(892)^- \rho^+$ P-wave	$< 1.5 \%$ CL=90%
$\Gamma_{107}$	$K^- \pi^+ f_0(980)$	
$\Gamma_{108}$	$\bar{K}^*(892)^0 f_0(980)$	
$\Gamma_{109}$	$K_1(1270)^- \pi^+$	[f] $(1.11 \pm 0.31) \%$
$\Gamma_{110}$	$K_1(1400)^- \pi^+$	$< 1.2 \%$ CL=90%
$\Gamma_{111}$	$\bar{K}_1(1400)^0 \pi^0$	$< 3.7 \%$ CL=90%
$\Gamma_{112}$	$K^*(1410)^- \pi^+$	
$\Gamma_{113}$	$\bar{K}^*(892)^0 \pi^+ \pi^- \pi^0$	$(1.8 \pm 0.9) \%$

$\Gamma_{114}$	$\bar{K}^*(892)^0 \eta$	
$\Gamma_{115}$	$K^- \pi^+ \omega$	( 3.0 $\pm$ 0.6 ) %
$\Gamma_{116}$	$\bar{K}^*(892)^0 \omega$	( 1.1 $\pm$ 0.4 ) %
$\Gamma_{117}$	$K^- \pi^+ \eta'(958)$	( 7.2 $\pm$ 1.8 ) $\times 10^{-3}$
$\Gamma_{118}$	$\bar{K}^*(892)^0 \eta'(958)$	< 1.1 $\times 10^{-3}$ CL=90%

### Hadronic modes with three $K$ 's

$\Gamma_{119}$	$K_S^0 K^+ K^-$	( 4.55 $\pm$ 0.34 ) $\times 10^{-3}$
$\Gamma_{120}$	$K_S^0 a_0(980)^0, a_0^0 \rightarrow K^+ K^-$	( 3.0 $\pm$ 0.4 ) $\times 10^{-3}$
$\Gamma_{121}$	$K^- a_0(980)^+, a_0^+ \rightarrow K^+ K_S^0$	( 6.1 $\pm$ 1.8 ) $\times 10^{-4}$
$\Gamma_{122}$	$K^+ a_0(980)^-, a_0^- \rightarrow K^- K_S^0$	< 1.1 $\times 10^{-4}$ CL=95%
$\Gamma_{123}$	$K_S^0 f_0(980), f_0 \rightarrow K^+ K^-$	< 1.0 $\times 10^{-4}$ CL=95%
$\Gamma_{124}$	$K_S^0 \phi, \phi \rightarrow K^+ K^-$	( 2.09 $\pm$ 0.16 ) $\times 10^{-3}$
$\Gamma_{125}$	$K_S^0 f_0(1400), f_0 \rightarrow K^+ K^-$	( 1.7 $\pm$ 1.1 ) $\times 10^{-4}$
$\Gamma_{126}$	$3K_S^0$	( 9.3 $\pm$ 1.3 ) $\times 10^{-4}$
$\Gamma_{127}$	$K^+ K^- K^- \pi^+$	( 2.11 $\pm$ 0.30 ) $\times 10^{-4}$
$\Gamma_{128}$	$K^+ K^- \bar{K}^*(892)^0,$ $\bar{K}^*(892)^0 \rightarrow K^- \pi^+$	( 4.2 $\pm$ 1.7 ) $\times 10^{-5}$
$\Gamma_{129}$	$K^- \pi^+ \phi, \phi \rightarrow K^+ K^-$	( 3.8 $\pm$ 1.6 ) $\times 10^{-5}$
$\Gamma_{130}$	$\phi \bar{K}^*(892)^0,$ $\phi \rightarrow K^+ K^-$ , $\bar{K}^*(892)^0 \rightarrow K^- \pi^+$	( 1.01 $\pm$ 0.19 ) $\times 10^{-4}$
$\Gamma_{131}$	$K^+ K^- K^- \pi^+$ nonresonant	( 3.2 $\pm$ 1.4 ) $\times 10^{-5}$
$\Gamma_{132}$	$K_S^0 K_S^0 K^\pm \pi^\mp$	( 6.1 $\pm$ 1.3 ) $\times 10^{-4}$

### Pionic modes

$\Gamma_{133}$	$\pi^+ \pi^-$	( 1.371 $\pm$ 0.032 ) $\times 10^{-3}$
$\Gamma_{134}$	$\pi^0 \pi^0$	( 7.9 $\pm$ 0.8 ) $\times 10^{-4}$
$\Gamma_{135}$	$\pi^+ \pi^- \pi^0$	( 1.41 $\pm$ 0.08 ) % S=1.9
$\Gamma_{136}$	$\rho^+ \pi^-$	( 1.08 $\pm$ 0.07 ) %
$\Gamma_{137}$	$\rho^0 \pi^0$	( 3.4 $\pm$ 0.5 ) $\times 10^{-3}$
$\Gamma_{138}$	$\rho^- \pi^+$	( 4.9 $\pm$ 0.5 ) $\times 10^{-3}$
$\Gamma_{139}$	$f_0(980) \pi^0, f_0(980) \rightarrow \pi^+ \pi^-$	< 4 $\times 10^{-6}$ CL=95%
$\Gamma_{140}$	$f_0(600) \pi^0, f_0(600) \rightarrow \pi^+ \pi^-$	< 3.0 $\times 10^{-5}$ CL=95%
$\Gamma_{141}$	$(\pi^+ \pi^-)_{S\text{-wave}} \pi^0$	< 2.7 $\times 10^{-4}$ CL=95%
$\Gamma_{142}$	$3\pi^0$	< 3.5 $\times 10^{-4}$ CL=90%
$\Gamma_{143}$	$2\pi^+ 2\pi^-$	( 7.33 $\pm$ 0.27 ) $\times 10^{-3}$
$\Gamma_{144}$	$\pi^+ \pi^- 2\pi^0$	( 9.8 $\pm$ 0.9 ) $\times 10^{-3}$
$\Gamma_{145}$	$\eta \pi^0$	[g] ( 5.6 $\pm$ 1.4 ) $\times 10^{-4}$
$\Gamma_{146}$	$\omega \pi^0$	[g] < 2.6 $\times 10^{-4}$ CL=90%
$\Gamma_{147}$	$2\pi^+ 2\pi^- \pi^0$	( 4.1 $\pm$ 0.5 ) $\times 10^{-3}$
$\Gamma_{148}$	$\eta \pi^+ \pi^-$	[g] < 1.9 $\times 10^{-3}$ CL=90%
$\Gamma_{149}$	$\omega \pi^+ \pi^-$	[g] ( 1.6 $\pm$ 0.5 ) $\times 10^{-3}$
$\Gamma_{150}$	$3\pi^+ 3\pi^-$	( 4.0 $\pm$ 1.1 ) $\times 10^{-4}$

### Hadronic modes with a $K\bar{K}$ pair

$\Gamma_{151}$	$K^+ K^-$	$( 3.85 \pm 0.09 ) \times 10^{-3}$
$\Gamma_{152}$	$2K_S^0$	$( 3.6 \pm 0.7 ) \times 10^{-4}$
$\Gamma_{153}$	$K_S^0 K^- \pi^+$	$( 3.4 \pm 0.5 ) \times 10^{-3}$
$\Gamma_{154}$	$\overline{K}^*(892)^0 K_S^0,$ $\overline{K}^*(892)^0 \rightarrow K^- \pi^+$	$< 6 \times 10^{-4}$ CL=90%
$\Gamma_{155}$	$K_S^0 K^+ \pi^-$	$( 2.6 \pm 0.5 ) \times 10^{-3}$
$\Gamma_{156}$	$K^*(892)^0 K_S^0, K^*(892)^0 \rightarrow$ $K^+ \pi^-$	$< 3 \times 10^{-4}$ CL=90%
$\Gamma_{157}$	$K^+ K^- \pi^0$	$( 3.20 \pm 0.16 ) \times 10^{-3}$
$\Gamma_{158}$	$K^*(892)^+ K^-, K^*(892)^+ \rightarrow$ $K^+ \pi^0$	$( 1.47 \pm 0.12 ) \times 10^{-3}$
$\Gamma_{159}$	$K^*(892)^- K^+, K^*(892)^- \rightarrow$ $K^- \pi^0$	$( 3.9 \pm 0.7 ) \times 10^{-4}$
$\Gamma_{160}$	$\phi \pi^0, \phi \rightarrow K^+ K^-$	$( 4.8 \pm 0.6 ) \times 10^{-4}$
$\Gamma_{161}$	$K^+ K^- \pi^0$ nonresonant	$( 1.15 \pm 0.13 ) \times 10^{-3}$
$\Gamma_{162}$	$K_S^0 K_S^0 \pi^0$	$< 5.9 \times 10^{-4}$
$\Gamma_{163}$	$K^+ K^- \pi^+ \pi^-$	[h] $( 2.31 \pm 0.12 ) \times 10^{-3}$
$\Gamma_{164}$	$\phi \pi^+ \pi^-$ 3-body, $\phi \rightarrow K^+ K^-$	$( 2.3 \pm 2.3 ) \times 10^{-5}$
$\Gamma_{165}$	$\phi \rho^0, \phi \rightarrow K^+ K^-$	$( 6.7 \pm 0.6 ) \times 10^{-4}$
$\Gamma_{166}$	$K^+ K^- \rho^0$ 3-body	$( 5 \pm 7 ) \times 10^{-5}$
$\Gamma_{167}$	$f_0(980) \pi^+ \pi^-, f_0 \rightarrow K^+ K^-$	$( 3.5 \pm 0.9 ) \times 10^{-4}$
$\Gamma_{168}$	$K^*(892)^0 K^\mp \pi^\pm$ 3-body, $K^{*0} \rightarrow K^\pm \pi^\mp$	[i] $( 2.5 \pm 0.5 ) \times 10^{-4}$
$\Gamma_{169}$	$K^*(892)^0 \overline{K}^*(892)^0, K^{*0} \rightarrow$ $K^\pm \pi^\mp$	$( 7 \pm 5 ) \times 10^{-5}$
$\Gamma_{170}$	$K_1(1270)^\pm K^\mp,$ $K_1(1270)^\pm \rightarrow K^\pm \pi^+ \pi^-$	$( 7.6 \pm 1.7 ) \times 10^{-4}$
$\Gamma_{171}$	$K_1(1400)^\pm K^\mp,$ $K_1(1400)^\pm \rightarrow K^\pm \pi^+ \pi^-$	$( 5.1 \pm 1.2 ) \times 10^{-4}$
$\Gamma_{172}$	$K^+ K^- \pi^+ \pi^-$ non- $\phi$	
$\Gamma_{173}$	$K^+ K^- \pi^+ \pi^-$ nonresonant	
$\Gamma_{174}$	$K_S^0 K_S^0 \pi^+ \pi^-$	$( 1.25 \pm 0.24 ) \times 10^{-3}$
$\Gamma_{175}$	$K_S^0 K^- \pi^+ \pi^+ \pi^-$	$< 1.5 \times 10^{-4}$ CL=90%
$\Gamma_{176}$	$K^+ K^- \pi^+ \pi^- \pi^0$	$( 3.1 \pm 2.0 ) \times 10^{-3}$

Fractions of most of the following modes with resonances have already appeared above as submodes of particular charged-particle modes.

$\Gamma_{177}$	$\overline{K}^*(892)^0 K_S^0$	$< 8 \times 10^{-4}$ CL=90%
$\Gamma_{178}$	$K^*(892)^0 K_S^0$	$< 4 \times 10^{-4}$ CL=90%
$\Gamma_{179}$	$\phi \pi^0$	$( 7.5 \pm 0.5 ) \times 10^{-4}$
$\Gamma_{180}$	$\phi \eta$	$( 1.4 \pm 0.4 ) \times 10^{-4}$
$\Gamma_{181}$	$\phi \omega$	$< 2.1 \times 10^{-3}$ CL=90%

### Radiative modes

$\Gamma_{182}$	$\rho^0 \gamma$	< 2.4	$\times 10^{-4}$	CL=90%
$\Gamma_{183}$	$\omega \gamma$	< 2.4	$\times 10^{-4}$	CL=90%
$\Gamma_{184}$	$\phi \gamma$	( 2.4 $\pm$ 0.7 )	$\times 10^{-5}$	
$\Gamma_{185}$	$\bar{K}^*(892)^0 \gamma$	< 7.6	$\times 10^{-4}$	CL=90%

### Doubly Cabibbo suppressed (DC) modes or $\Delta C = 2$ forbidden via mixing (C2M) modes

$\Gamma_{186}$	$K^+ \ell^- \bar{\nu}_\ell$ (via $\bar{D}^0$ )	C2M	< 1.8	$\times 10^{-4}$	CL=90%
$\Gamma_{187}$	$K^+$ or $K^*(892)^+ e^- \bar{\nu}_e$ (via $\bar{D}^0$ )	C2M	< 6	$\times 10^{-5}$	CL=90%
$\Gamma_{188}$	$K^+ \pi^-$	DC	( 1.45 $\pm$ 0.04 )	$\times 10^{-4}$	
$\Gamma_{189}$	$K^+ \pi^-$ (via $\bar{D}^0$ )	C2M	< 1.5	$\times 10^{-5}$	CL=95%
$\Gamma_{190}$	$K_S^0 \pi^+ \pi^-$ (in $D^0 \rightarrow \bar{D}^0$ )	C2M	< 1.8	$\times 10^{-4}$	CL=95%
$\Gamma_{191}$	$K^*(892)^+ \pi^-$ , $K^*(892)^+ \rightarrow K_S^0 \pi^+$	DC	( 10 $\pm$ 12 )	$\times 10^{-5}$	
$\Gamma_{192}$	$K^+ \pi^- \pi^0$	DC	( 2.96 $\pm$ 0.19 )	$\times 10^{-4}$	
$\Gamma_{193}$	$K^+ \pi^- \pi^0$ (via $\bar{D}^0$ )	C2M	< 7	$\times 10^{-5}$	CL=95%
$\Gamma_{194}$	$K^+ \pi^- \pi^+ \pi^-$	DC	( 2.49 $\pm$ 0.21 )	$\times 10^{-4}$	
$\Gamma_{195}$	$K^+ \pi^- \pi^+ \pi^-$ (via $\bar{D}^0$ )	C2M	< 4	$\times 10^{-4}$	CL=90%
$\Gamma_{196}$	$K^+ \pi^-$ or $K^+ \pi^- \pi^+ \pi^-$ (via $\bar{D}^0$ )				
$\Gamma_{197}$	$\mu^-$ anything (via $\bar{D}^0$ )	C2M	< 4	$\times 10^{-4}$	CL=90%

### $\Delta C = 1$ weak neutral current (C1) modes, Lepton Family number (LF) violating modes, or Lepton number (L) violating modes

$\Gamma_{198}$	$\gamma \gamma$	C1	< 2.6	$\times 10^{-5}$	CL=90%
$\Gamma_{199}$	$e^+ e^-$	C1	< 1.2	$\times 10^{-6}$	CL=90%
$\Gamma_{200}$	$\mu^+ \mu^-$	C1	< 1.3	$\times 10^{-6}$	CL=90%
$\Gamma_{201}$	$\pi^0 e^+ e^-$	C1	< 4.5	$\times 10^{-5}$	CL=90%
$\Gamma_{202}$	$\pi^0 \mu^+ \mu^-$	C1	< 1.8	$\times 10^{-4}$	CL=90%
$\Gamma_{203}$	$\eta e^+ e^-$	C1	< 1.1	$\times 10^{-4}$	CL=90%
$\Gamma_{204}$	$\eta \mu^+ \mu^-$	C1	< 5.3	$\times 10^{-4}$	CL=90%
$\Gamma_{205}$	$\pi^+ \pi^- e^+ e^-$	C1	< 3.73	$\times 10^{-4}$	CL=90%
$\Gamma_{206}$	$\rho^0 e^+ e^-$	C1	< 1.0	$\times 10^{-4}$	CL=90%
$\Gamma_{207}$	$\pi^+ \pi^- \mu^+ \mu^-$	C1	< 3.0	$\times 10^{-5}$	CL=90%
$\Gamma_{208}$	$\rho^0 \mu^+ \mu^-$	C1	< 2.2	$\times 10^{-5}$	CL=90%
$\Gamma_{209}$	$\omega e^+ e^-$	C1	< 1.8	$\times 10^{-4}$	CL=90%
$\Gamma_{210}$	$\omega \mu^+ \mu^-$	C1	< 8.3	$\times 10^{-4}$	CL=90%
$\Gamma_{211}$	$K^- K^+ e^+ e^-$	C1	< 3.15	$\times 10^{-4}$	CL=90%
$\Gamma_{212}$	$\phi e^+ e^-$	C1	< 5.2	$\times 10^{-5}$	CL=90%
$\Gamma_{213}$	$K^- K^+ \mu^+ \mu^-$	C1	< 3.3	$\times 10^{-5}$	CL=90%

$\Gamma_{214}$	$\phi \mu^+ \mu^-$	$C1$	$< 3.1$	$\times 10^{-5}$	CL=90%
$\Gamma_{215}$	$\overline{K}^0 e^+ e^-$		$ j  < 1.1$	$\times 10^{-4}$	CL=90%
$\Gamma_{216}$	$\overline{K}^0 \mu^+ \mu^-$		$ j  < 2.6$	$\times 10^{-4}$	CL=90%
$\Gamma_{217}$	$K^- \pi^+ e^+ e^-$	$C1$	$< 3.85$	$\times 10^{-4}$	CL=90%
$\Gamma_{218}$	$\overline{K}^*(892)^0 e^+ e^-$		$ j  < 4.7$	$\times 10^{-5}$	CL=90%
$\Gamma_{219}$	$K^- \pi^+ \mu^+ \mu^-$	$C1$	$< 3.59$	$\times 10^{-4}$	CL=90%
$\Gamma_{220}$	$\overline{K}^*(892)^0 \mu^+ \mu^-$		$ j  < 2.4$	$\times 10^{-5}$	CL=90%
$\Gamma_{221}$	$\pi^+ \pi^- \pi^0 \mu^+ \mu^-$	$C1$	$< 8.1$	$\times 10^{-4}$	CL=90%
$\Gamma_{222}$	$\mu^\pm e^\mp$	$LF$	$ k  < 8.1$	$\times 10^{-7}$	CL=90%
$\Gamma_{223}$	$\pi^0 e^\pm \mu^\mp$	$LF$	$ k  < 8.6$	$\times 10^{-5}$	CL=90%
$\Gamma_{224}$	$\eta e^\pm \mu^\mp$	$LF$	$ k  < 1.0$	$\times 10^{-4}$	CL=90%
$\Gamma_{225}$	$\pi^+ \pi^- e^\pm \mu^\mp$	$LF$	$ k  < 1.5$	$\times 10^{-5}$	CL=90%
$\Gamma_{226}$	$\rho^0 e^\pm \mu^\mp$	$LF$	$ k  < 4.9$	$\times 10^{-5}$	CL=90%
$\Gamma_{227}$	$\omega e^\pm \mu^\mp$	$LF$	$ k  < 1.2$	$\times 10^{-4}$	CL=90%
$\Gamma_{228}$	$K^- K^+ e^\pm \mu^\mp$	$LF$	$ k  < 1.8$	$\times 10^{-4}$	CL=90%
$\Gamma_{229}$	$\phi e^\pm \mu^\mp$	$LF$	$ k  < 3.4$	$\times 10^{-5}$	CL=90%
$\Gamma_{230}$	$\overline{K}^0 e^\pm \mu^\mp$	$LF$	$ k  < 1.0$	$\times 10^{-4}$	CL=90%
$\Gamma_{231}$	$K^- \pi^+ e^\pm \mu^\mp$	$LF$	$ k  < 5.53$	$\times 10^{-4}$	CL=90%
$\Gamma_{232}$	$\overline{K}^*(892)^0 e^\pm \mu^\mp$	$LF$	$ k  < 8.3$	$\times 10^{-5}$	CL=90%
$\Gamma_{233}$	$\pi^- \pi^- e^+ e^+ + \text{c.c.}$	$L$	$< 1.12$	$\times 10^{-4}$	CL=90%
$\Gamma_{234}$	$\pi^- \pi^- \mu^+ \mu^+ + \text{c.c.}$	$L$	$< 2.9$	$\times 10^{-5}$	CL=90%
$\Gamma_{235}$	$K^- \pi^- e^+ e^+ + \text{c.c.}$	$L$	$< 2.06$	$\times 10^{-4}$	CL=90%
$\Gamma_{236}$	$K^- \pi^- \mu^+ \mu^+ + \text{c.c.}$	$L$	$< 3.9$	$\times 10^{-4}$	CL=90%
$\Gamma_{237}$	$K^- K^- e^+ e^+ + \text{c.c.}$	$L$	$< 1.52$	$\times 10^{-4}$	CL=90%
$\Gamma_{238}$	$K^- K^- \mu^+ \mu^+ + \text{c.c.}$	$L$	$< 9.4$	$\times 10^{-5}$	CL=90%
$\Gamma_{239}$	$\pi^- \pi^- e^+ \mu^+ + \text{c.c.}$	$L$	$< 7.9$	$\times 10^{-5}$	CL=90%
$\Gamma_{240}$	$K^- \pi^- e^+ \mu^+ + \text{c.c.}$	$L$	$< 2.18$	$\times 10^{-4}$	CL=90%
$\Gamma_{241}$	$K^- K^- e^+ \mu^+ + \text{c.c.}$	$L$	$< 5.7$	$\times 10^{-5}$	CL=90%

$\Gamma_{242}$  A dummy mode used by the fit.  $(37.2 \pm 1.9) \%$  S=1.1

- [a] This value is obtained by subtracting the branching fractions for 2-, 4- and 6-prongs from unity.
- [b] This is the sum of our  $K^- \pi^+ \pi^+ \pi^-$ ,  $K^- \pi^+ \pi^+ \pi^- \pi^0$ ,  $\overline{K}^0 2\pi^+ 2\pi^-$ ,  $2\pi^+ 2\pi^-$ ,  $2\pi^+ 2\pi^- \pi^0$ ,  $K^+ K^- \pi^+ \pi^-$ , and  $K^+ K^- \pi^+ \pi^- \pi^0$ , branching fractions.
- [c] The branching fractions for the  $K^- e^+ \nu_e$ ,  $K^*(892)^- e^+ \nu_e$ ,  $\pi^- e^+ \nu_e$ , and  $\rho^- e^+ \nu_e$  modes add up to  $6.14 \pm 0.20$ %.
- [d] The branching fraction for this mode may differ from the sum of the submodes that contribute to it, due to interference effects. See the relevant papers.
- [e] This is a doubly Cabibbo-suppressed mode.

- [f] The two experiments measuring this fraction are in serious disagreement.  
See the Particle Listings.
  - [g] This branching fraction includes all the decay modes of the resonance in the final state.
  - [h] The experiments on the division of this charge mode amongst its sub-modes disagree, and the submode branching fractions here add up to considerably more than the charged-mode fraction.
  - [i] However, these upper limits are in serious disagreement with values obtained in another experiment.
  - [j] This mode is not a useful test for a  $\Delta C=1$  weak neutral current because both quarks must change flavor in this decay.
  - [k] The value is for the sum of the charge states or particle/antiparticle states indicated.
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## **CONSTRAINED FIT INFORMATION**

An overall fit to 44 branching ratios uses 82 measurements and one constraint to determine 23 parameters. The overall fit has a  $\chi^2 = 49.7$  for 60 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients  $\langle \delta x_i \delta x_j \rangle / (\delta x_i \cdot \delta x_j)$ , in percent, from the fit to the branching fractions,  $x_i \equiv \Gamma_i / \Gamma_{\text{total}}$ . The fit constrains the  $x_i$  whose labels appear in this array to sum to one.

$x_{18}$	1									
$x_{19}$	22	6								
$x_{20}$	0	0	0							
$x_{29}$	0	16	1	0						
$x_{30}$	4	1	18	0	0					
$x_{32}$	6	22	29	1	3	5				
$x_{33}$	0	1	2	10	0	0	6			
$x_{34}$	1	2	3	16	0	0	9	63		
$x_{46}$	1	4	5	0	1	1	18	1	2	
$x_{58}$	3	10	13	1	2	2	45	3	5	52
$x_{67}$	0	1	1	7	0	0	5	29	46	1
$x_{75}$	1	4	5	0	1	1	16	1	2	11
$x_{89}$	0	1	1	7	0	0	4	58	45	1
$x_{90}$	0	1	1	5	0	0	3	21	34	1
$x_{96}$	0	1	2	0	0	0	6	0	1	7
$x_{98}$	0	1	1	1	0	0	4	3	4	4
$x_{109}$	0	1	1	3	0	0	2	11	18	1
$x_{135}$	1	4	5	0	1	1	17	1	2	72
$x_{143}$	3	10	13	1	2	2	46	3	4	19
$x_{153}$	0	1	2	6	0	0	5	23	37	1
$x_{155}$	0	1	1	4	0	0	5	16	26	1
$x_{242}$	-38	-12	-23	-15	-3	-5	-32	-33	-44	-50
	$x_6$	$x_{18}$	$x_{19}$	$x_{20}$	$x_{29}$	$x_{30}$	$x_{32}$	$x_{33}$	$x_{34}$	$x_{46}$

$x_{67}$	3								
$x_{75}$	23	1							
$x_{89}$	2	21	1						
$x_{90}$	2	41	1	15					
$x_{96}$	14	0	3	0	0				
$x_{98}$	8	8	2	2	3	1			
$x_{109}$	3	38	1	8	16	0	3		
$x_{135}$	39	1	9	1	1	5	3	1	
$x_{143}$	40	2	11	2	2	6	3	1	16
$x_{153}$	3	17	1	17	12	0	2	7	1
$x_{155}$	2	12	1	12	9	0	1	5	1
$x_{242}$	-48	-57	-32	-24	-35	-24	-36	-36	-39
	$x_{58}$	$x_{67}$	$x_{75}$	$x_{89}$	$x_{90}$	$x_{96}$	$x_{98}$	$x_{109}$	$x_{135}$
									$x_{143}$
$x_{155}$	10								
$x_{242}$	-19	-15							
	$x_{153}$	$x_{155}$							

## CONSTRAINED FIT INFORMATION

An overall fit to 3 branching ratios uses 3 measurements and one constraint to determine 4 parameters. The overall fit has a  $\chi^2 = 0.0$  for 0 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients  $\langle \delta x_i \delta x_j \rangle / (\delta x_i \cdot \delta x_j)$ , in percent, from the fit to the branching fractions,  $x_i \equiv \Gamma_i / \Gamma_{\text{total}}$ . The fit constrains the  $x_i$  whose labels appear in this array to sum to one.

$x_2$	-100			
$x_3$	-48	41		
$x_4$	-2	0	0	
	$x_1$	$x_2$	$x_3$	

## $D^0$ BRANCHING RATIOS

Some older now obsolete results have been omitted from these Listings.

### Topological modes

#### $\Gamma(0\text{-prongs})/\Gamma_{\text{total}}$

This value is obtained by subtracting the branching fractions for 2-, 4-, and 6-prongs from unity.

VALUE

DOCUMENT ID

**0.19±0.06 OUR FIT**

#### $\Gamma_1/\Gamma$

### $\Gamma(4\text{-prongs})/\Gamma_{\text{total}}$

### $\Gamma_3/\Gamma$

This is the sum of our  $K^-\pi^+\pi^+\pi^-$ ,  $K^-\pi^+\pi^+\pi^-\pi^0$ ,  $\bar{K}^02\pi^+2\pi^-$ ,  $2\pi^+2\pi^-$ ,  $2\pi^+2\pi^-\pi^0$ ,  $K^+K^-\pi^+\pi^-$ , and  $K^+K^-\pi^+\pi^-\pi^0$  branching fractions.

VALUE	DOCUMENT ID
<b>0.138±0.005 OUR FIT</b>	
<b>0.138±0.005</b>	PDG 06

### $\Gamma(4\text{-prongs})/\Gamma(2\text{-prongs})$

### $\Gamma_3/\Gamma_2$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.207±0.016 OUR FIT</b>				
<b>0.207±0.016±0.004</b>	226	ONENGUT	05	CHRS $\nu_\mu$ emulsion, $\bar{E}_\nu \approx 27 \text{ GeV}$

### $\Gamma(6\text{-prongs})/\Gamma_{\text{total}}$

### $\Gamma_4/\Gamma$

VALUE (units $10^{-3}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
<b>1.2<sup>+1.3</sup><sub>-0.7</sub> OUR FIT</b>				
<b>1.2<sup>+1.3</sup><sub>-0.9</sub>±0.2</b>	3	ONENGUT	05	CHRS $\nu_\mu$ emulsion, $\bar{E}_\nu \approx 27 \text{ GeV}$

### Inclusive modes

### $\Gamma(e^+\text{anything})/\Gamma_{\text{total}}$

### $\Gamma_5/\Gamma$

The branching fractions for the  $K^-\pi^+\nu_e$ ,  $K^*(892)^-\pi^+\nu_e$ ,  $\pi^-\pi^+\nu_e$ , and  $\rho^-\pi^+\nu_e$  modes add up to  $6.14 \pm 0.20 \%$ .

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.0655±0.0017 OUR AVERAGE</b>				
0.0646±0.0017±0.0013	2246 ± 57	23 ADAM	06A CLEO	$e^+e^-$ at $\psi(3770)$
0.069 ± 0.003 ± 0.005	1670	ALBRECHT	96C ARG	$e^+e^- \approx 10 \text{ GeV}$
0.0664±0.0018±0.0029	4609	24 KUBOTA	96B CLE2	$e^+e^- \approx \gamma(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.15 ± 0.05		AGUILAR-...	87E HYBR	$\pi p, pp$ 360,400 GeV
0.075 ± 0.011 ± 0.004	137	BALTRUSAIT..	85B MRK3	$e^+e^-$ 3.77 GeV
0.055 ± 0.037	12	SCHINDLER	81 MRK2	$e^+e^-$ 3.771 GeV

<sup>23</sup> Using the  $D^+$  and  $D^0$  lifetimes, ADAM 06A finds that the ratio of the  $D^+$  and  $D^0$  inclusive  $e^+$  widths is  $0.985 \pm 0.028 \pm 0.015$ , consistent with the isospin-invariance prediction of 1.

<sup>24</sup> KUBOTA 96B uses  $D^{*+} \rightarrow D^0\pi^+$  (and charge conjugate) events in which the  $D^0$  subsequently decays to  $X e^+\nu_e$ .

### $\Gamma(\mu^+\text{anything})/\Gamma_{\text{total}}$

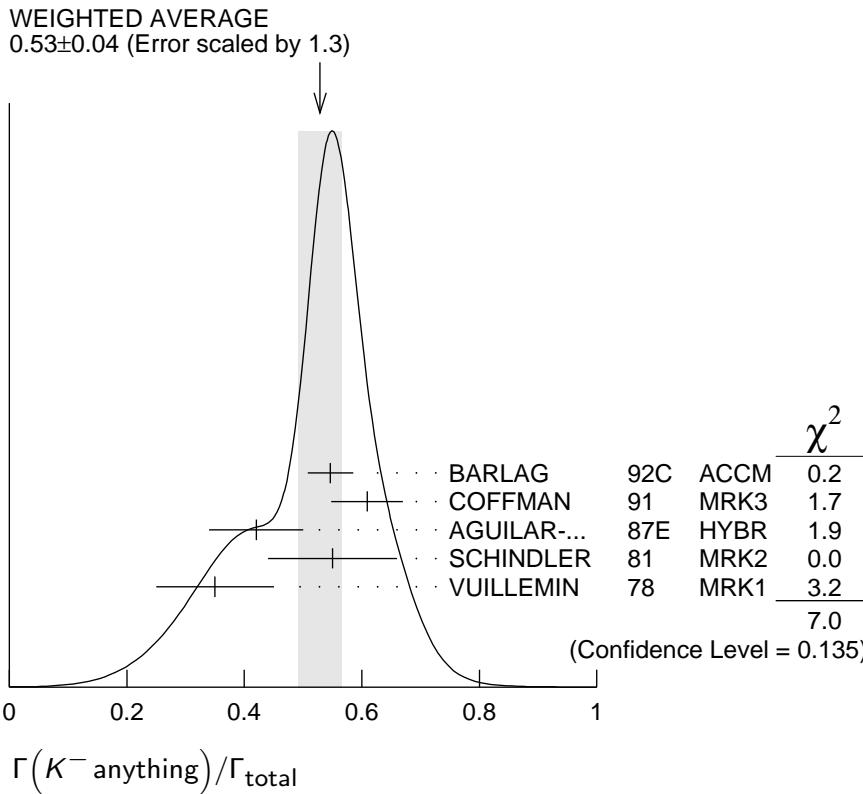
### $\Gamma_6/\Gamma$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.066±0.006 OUR FIT</b>				
<b>0.063±0.009 OUR AVERAGE</b>				
0.065±0.012±0.003	36	KAYIS-TOPAK.05	CHRS	$\nu_\mu$ emulsion
0.060±0.007±0.012	310	ALBRECHT	96C ARG	$e^+e^- \approx 10 \text{ GeV}$

### $\Gamma(K^- \text{ anything})/\Gamma_{\text{total}}$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.53 ±0.04 OUR AVERAGE</b>	Error includes scale factor of 1.3. See the ideogram below.			
0.546 ±0.039	25	BARLAG	92C	ACCM $\pi^-$ Cu 230 GeV
-0.038				
0.609 ±0.032 ±0.052		COFFMAN	91	MRK3 $e^+ e^-$ 3.77 GeV
0.42 ±0.08		AGUILAR-...	87E	HYBR $\pi p, pp$ 360, 400 GeV
0.55 ±0.11	121	SCHINDLER	81	MRK2 $e^+ e^-$ 3.771 GeV
0.35 ±0.10	19	VUILLEMIN	78	MRK1 $e^+ e^-$ 3.772 GeV

25 BARLAG 92C computes the branching fraction using topological normalization.



### $[\Gamma(\bar{K}^0 \text{ anything}) + \Gamma(K^0 \text{ anything})]/\Gamma_{\text{total}}$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.47 ±0.04 OUR AVERAGE</b>				
0.476 ±0.048 ±0.030	250 ± 25	ABLIKIM	06U	BES2 $e^+ e^-$ at 3773 MeV
0.455 ±0.050 ±0.032		COFFMAN	91	MRK3 $e^+ e^-$ 3.77 GeV

### $\Gamma(K^+ \text{ anything})/\Gamma_{\text{total}}$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.034 ±0.006 OUR AVERAGE</b>				
0.034 ±0.007	26	BARLAG	92C	ACCM $\pi^-$ Cu 230 GeV
-0.005				
0.028 ±0.009 ±0.004		COFFMAN	91	MRK3 $e^+ e^-$ 3.77 GeV
0.03 ±0.05		AGUILAR-...	87E	HYBR $\pi p, pp$ 360, 400 GeV
-0.02				
0.08 ±0.03	25	SCHINDLER	81	MRK2 $e^+ e^-$ 3.771 GeV

<sup>26</sup> BARLAG 92C computes the branching fraction using topological normalization.

$\Gamma(K^*(892)^- \text{anything})/\Gamma_{\text{total}}$

VALUE	EVTS
<b>0.153±0.083±0.019</b>	28 ± 15

$\Gamma_{10}/\Gamma$

DOCUMENT ID	TECN	COMMENT
ABLIKIM	06U BES2	$e^+ e^-$ at 3773 MeV

$\Gamma(K^*(892)^0 \text{anything})/\Gamma_{\text{total}}$

VALUE	EVTS
<b>0.087±0.040±0.012</b>	96 ± 44

$\Gamma_{11}/\Gamma$

DOCUMENT ID	TECN	COMMENT
ABLIKIM	05P BES	$e^+ e^- \approx 3773$ MeV

$\Gamma(K^*(892)^+ \text{anything})/\Gamma_{\text{total}}$

VALUE	CL%
<b>&lt;0.036</b>	90

$\Gamma_{12}/\Gamma$

DOCUMENT ID	TECN	COMMENT
ABLIKIM	06U BES2	$e^+ e^-$ at 3773 MeV

$\Gamma(K^*(892)^0 \text{anything})/\Gamma_{\text{total}}$

VALUE	EVTS
<b>0.028±0.012±0.004</b>	31 ± 12

$\Gamma_{13}/\Gamma$

DOCUMENT ID	TECN	COMMENT
ABLIKIM	05P BES	$e^+ e^- \approx 3773$ MeV

$\Gamma(\eta \text{ anything})/\Gamma_{\text{total}}$

This ratio includes  $\eta$  particles from  $\eta'$  decays.

VALUE (units $10^{-2}$ )	EVTS
<b>9.5±0.4±0.8</b>	4463 ± 197

$\Gamma_{14}/\Gamma$

DOCUMENT ID	TECN	COMMENT
HUANG	06B CLEO	$e^+ e^-$ at $\psi(3770)$

$\Gamma(\eta' \text{ anything})/\Gamma_{\text{total}}$

VALUE (units $10^{-2}$ )	EVTS
<b>2.48±0.17±0.21</b>	299 ± 21

$\Gamma_{15}/\Gamma$

DOCUMENT ID	TECN	COMMENT
HUANG	06B CLEO	$e^+ e^-$ at $\psi(3770)$

$\Gamma(\phi \text{ anything})/\Gamma_{\text{total}}$

VALUE (units $10^{-2}$ )	EVTS
<b>1.05±0.08±0.07</b>	368 ± 24

$\Gamma_{16}/\Gamma$

DOCUMENT ID	TECN	COMMENT
HUANG	06B CLEO	$e^+ e^-$ at $\psi(3770)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$1.71^{+0.76}_{-0.71} \pm 0.17$	9	BAI	00C BES	$e^+ e^- \rightarrow D\bar{D}^*, D^*\bar{D}^*$
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———— Semileptonic modes ————

$\Gamma(K^- e^+ \nu_e)/\Gamma_{\text{total}}$

VALUE (units $10^{-2}$ )	EVTS
<b>3.50±0.09 OUR FIT</b>	

$\Gamma_{18}/\Gamma$

DOCUMENT ID	TECN	COMMENT

**3.46±0.11 OUR AVERAGE**

3.45±0.10±0.19	1318 ± 38	WIDHALM	06	BELL	$e^+ e^- \approx \gamma(4S)$
3.44±0.10±0.10	1311 ± 37	COAN	05	CLEO	$e^+ e^-$ at $\psi(3770)$
3.82±0.40±0.27	104 ± 11	ABLIKIM	04C	BES	$e^+ e^-$ , 3.773 GeV
3.4 ± 0.5 ± 0.4	55	ADLER	89	MRK3	$e^+ e^-$ 3.77 GeV

$\Gamma(K^- e^+ \nu_e)/\Gamma(K^- \pi^+)$  $\Gamma_{18}/\Gamma_{32}$ 

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.918±0.026 OUR FIT</b>				
<b>0.95 ±0.04 OUR AVERAGE</b>				
0.978±0.027±0.044	2510	27 BEAN	93C CLE2	$e^+ e^- \approx \gamma(4S)$
0.90 ±0.06 ±0.06	584	28 CRAWFORD	91B CLEO	$e^+ e^- \approx 10.5 \text{ GeV}$
0.91 ±0.07 ±0.11	250	29 ANJOS	89F E691	Photoproduction

- 27 BEAN 93C uses  $K^- \mu^+ \nu_\mu$  as well as  $K^- e^+ \nu_e$  events and makes a small phase-space adjustment to the number of the  $\mu^+$  events to use them as  $e^+$  events. A pole mass of  $2.00 \pm 0.12 \pm 0.18 \text{ GeV}/c^2$  is obtained from the  $q^2$  dependence of the decay rate.
- 28 CRAWFORD 91B uses  $K^- e^+ \nu_e$  and  $K^- \mu^+ \nu_\mu$  candidates to measure a pole mass of  $2.1^{+0.4}_{-0.2}{}^{+0.3}_{-0.2} \text{ GeV}/c^2$  from the  $q^2$  dependence of the decay rate.
- 29 ANJOS 89F measures a pole mass of  $2.1^{+0.4}_{-0.2} \pm 0.2 \text{ GeV}/c^2$  from the  $q^2$  dependence of the decay rate.

 $\Gamma(K^- \mu^+ \nu_\mu)/\Gamma_{\text{total}}$  $\Gamma_{19}/\Gamma$ 

VALUE (units $10^{-2}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
<b>3.27±0.13 OUR FIT</b>				
<b>3.45±0.10±0.21</b>	$1249 \pm 43$	WIDHALM	06 BELL	$e^+ e^- \approx \gamma(4S)$

 $\Gamma(K^- \mu^+ \nu_\mu)/\Gamma(K^- \pi^+)$  $\Gamma_{19}/\Gamma_{32}$ 

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.857±0.033 OUR FIT</b>				
<b>0.84 ±0.04 OUR AVERAGE</b>				
0.852±0.034±0.028	1897	30 FRABETTI	95G E687	$\gamma \text{Be } \bar{E}_\gamma = 220 \text{ GeV}$
0.82 ±0.13 ±0.13	338	31 FRABETTI	93I E687	$\gamma \text{Be } \bar{E}_\gamma = 221 \text{ GeV}$
0.79 ±0.08 ±0.09	231	32 CRAWFORD	91B CLEO	$e^+ e^- \approx 10.5 \text{ GeV}$
30 FRABETTI 95G extracts the ratio of form factors $f_-(0)/f_+(0) = -1.3^{+3.6}_{-3.4} \pm 0.6$ , and measures a pole mass of $1.87^{+0.11}_{-0.08}{}^{+0.07}_{-0.06} \text{ GeV}/c^2$ from the $q^2$ dependence of the decay rate.				
31 FRABETTI 93I measures a pole mass of $2.1^{+0.7}_{-0.3}{}^{+0.7}_{-0.3} \text{ GeV}/c^2$ from the $q^2$ dependence of the decay rate.				
32 CRAWFORD 91B measures a pole mass of $2.00 \pm 0.12 \pm 0.18 \text{ GeV}/c^2$ from the $q^2$ dependence of the decay rate.				

 $\Gamma(K^- \mu^+ \nu_\mu)/\Gamma(\mu^+ \text{anything})$  $\Gamma_{19}/\Gamma_6$ 

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.49 ±0.05 OUR FIT</b>				
<b>0.472±0.051±0.040</b>	232	KODAMA	94 E653	$\pi^-$ emulsion 600 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				

0.32 ±0.05 ±0.05      124      KODAMA      91 EMUL  $pA$  800 GeV $\Gamma(K^- \pi^0 e^+ \nu_e)/\Gamma_{\text{total}}$  $\Gamma_{22}/\Gamma$ 

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.016 $^{+0.013}_{-0.005}$ ±0.002	4	33 BAI	91 MRK3	$e^+ e^- \approx 3.77 \text{ GeV}$

<sup>33</sup> BAI 91 finds that a fraction  $0.79^{+0.15+0.09}_{-0.17-0.03}$  of combined  $D^+$  and  $D^0$  decays to  $\bar{K}\pi e^+ \nu_e$  (24 events) are  $\bar{K}^*(892) e^+ \nu_e$ . BAI 91 uses 56  $K^- e^+ \nu_e$  events to measure a pole mass of  $1.8 \pm 0.3 \pm 0.2$  GeV/ $c^2$  from the  $q^2$  dependence of the decay rate.

### $\Gamma(\bar{K}^0 \pi^- e^+ \nu_e)/\Gamma_{\text{total}}$ $\Gamma_{23}/\Gamma$

VALUE (units $10^{-2}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
<b>2.7 <math>^{+0.9}_{-0.7}</math> OUR AVERAGE</b>				
2.61 $\pm 1.04 \pm 0.28$	9 $\pm 3$	ABLIKIM	060 BES2	$e^+ e^-$ at 3773 MeV

<sup>34</sup> BAI 91 finds that a fraction  $0.79^{+0.15+0.09}_{-0.17-0.03}$  of combined  $D^+$  and  $D^0$  decays to  $\bar{K}\pi e^+ \nu_e$  (24 events) are  $\bar{K}^*(892) e^+ \nu_e$ .

### $\Gamma(K^*(892)^- e^+ \nu_e)/\Gamma_{\text{total}}$ $\Gamma_{20}/\Gamma$

Both decay modes of the  $K^*(892)^-$  are included.

VALUE (units $10^{-2}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
<b>2.16 <math>\pm 0.16</math> OUR FIT</b>				
<b>2.16 <math>\pm 0.15 \pm 0.08</math></b>	219 $\pm 16$	<sup>35</sup> COAN	05 CLEO	$e^+ e^-$ at $\psi(3770)$

<sup>35</sup> COAN 05 uses both  $K^- \pi^0$  and  $K_S^0 \pi^-$  events.

### $\Gamma(K^*(892)^- e^+ \nu_e)/\Gamma(K_S^0 \pi^+ \pi^-)$ $\Gamma_{20}/\Gamma_{34}$

Unseen decay modes of the  $K^*(892)^-$  are included.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.75 <math>\pm 0.07</math> OUR FIT</b>				
<b>0.76 <math>\pm 0.12 \pm 0.06</math></b>	152	<sup>36</sup> BEAN	93C CLE2	$e^+ e^- \approx \gamma(4S)$

<sup>36</sup> BEAN 93C uses  $K^* \mu^+ \nu_\mu$  as well as  $K^* e^+ \nu_e$  events and makes a small phase-space adjustment to the number of the  $\mu^+$  events to use them as  $e^+$  events.

### $\Gamma(K^*(892)^- e^+ \nu_e)/\Gamma(K^- e^+ \nu_e)$ $\Gamma_{20}/\Gamma_{18}$

Unseen decay modes of the  $K^*(892)^-$  are included.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				

0.51  $\pm 0.18 \pm 0.06$  CRAWFORD 91B CLEO  $e^+ e^- \approx 10.5$  GeV

### $\Gamma(K^*(892)^- \mu^+ \nu_\mu)/\Gamma(K_S^0 \pi^+ \pi^-)$ $\Gamma_{21}/\Gamma_{34}$

Unseen decay modes of the  $K^*(892)^-$  are included.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.674 <math>\pm 0.068 \pm 0.026</math></b>	175 $\pm 17$	<sup>37</sup> LINK	05B FOCS	$\gamma A, \bar{E}_\gamma \approx 180$ GeV

<sup>37</sup> LINK 05B finds that in  $D^0 \rightarrow \bar{K}^0 \pi^- \mu^+ \nu_\mu$  the  $\bar{K}^0 \pi^-$  system is 6% in  $S$ -wave.

### $\Gamma(K^*(892)^- \ell^+ \nu_\ell)/\Gamma(K_S^0 \pi^+ \pi^-)$ $\Gamma_{25}/\Gamma_{34}$

This an average of the  $K^*(892)^- e^+ \nu_e$  and  $K^*(892)^- \mu^+ \nu_\mu$  ratios. Unseen decay modes of the  $K^*(892)^-$  are included.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.48 $\pm 0.14 \pm 0.12$	137	<sup>38</sup> ALEXANDER	90B CLEO	$e^+ e^- 10.5-11$ GeV

<sup>38</sup> ALEXANDER 90B cannot exclude extra  $\pi^0$ 's in the final state.

$\Gamma(K^-\pi^+\pi^-\mu^+\nu_\mu)/\Gamma(K^-\mu^+\nu_\mu)$   $\Gamma_{27}/\Gamma_{19}$ 

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>&lt;0.037</b>	90	KODAMA	93B E653	$\pi^-$ emulsion 600 GeV

 $\Gamma((\bar{K}^*(892)\pi)^-\mu^+\nu_\mu)/\Gamma(K^-\mu^+\nu_\mu)$   $\Gamma_{28}/\Gamma_{19}$ 

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>&lt;0.043</b>	90	39 KODAMA	93B E653	$\pi^-$ emulsion 600 GeV

39 KODAMA 93B searched in  $K^-\pi^+\pi^-\mu^+\nu_\mu$ , but the limit includes other  $(\bar{K}^*(892)\pi)^-$  charge states.

 $\Gamma(\pi^-e^+\nu_e)/\Gamma_{\text{total}}$   $\Gamma_{29}/\Gamma$ 

<u>VALUE (units <math>10^{-2}</math>)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.280±0.017 OUR FIT</b>				

**0.269±0.020 OUR AVERAGE**

0.279±0.027±0.016	126 ± 12	40 WIDHALM	06 BELL	$e^+e^- \approx \gamma(4S)$
0.262±0.025±0.008	117 ± 11	COAN	05 CLEO	$e^+e^-$ at $\psi(3770)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

0.33 ± 0.13 ± 0.03	9 ± 4	41 ABLIKIM	04C BES	$e^+e^-$ , 3.773 GeV
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0.39 +0.23 -0.11	± 0.04	7	42 ADLER	89 MRK3 $e^+e^-$ 3.77 GeV
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40 This result of WIDHALM 06 gives  $|\frac{V_{cd}}{V_{cs}} \cdot \frac{f_+^\pi(0)}{f_+^K(0)}|^2 = 0.042 \pm 0.003 \pm 0.003$ .

41 ABLIKIM 04C measures  $|\frac{f_+^\pi(0)}{f_+^K(0)}|$  to be  $0.93 \pm 0.19 \pm 0.07$ .

42 This result of ADLER 89 gives  $|\frac{V_{cd}}{V_{cs}} \cdot \frac{f_+^\pi(0)}{f_+^K(0)}|^2 = 0.057^{+0.038}_{-0.015} \pm 0.005$ .

 $\Gamma(\pi^-e^+\nu_e)/\Gamma(K^-\pi^+\nu_e)$   $\Gamma_{29}/\Gamma_{18}$ 

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.080±0.005 OUR FIT</b>				

**0.085±0.007 OUR AVERAGE**

0.082±0.006±0.005		43 HUANG	05 CLEO	$e^+e^- \approx \gamma(4S)$
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0.101±0.020±0.003	91	44 FRABETTI	96B E687	$\gamma$ Be, $\bar{E}_\gamma \approx 200$ GeV
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0.103±0.039±0.013	87	45 BUTLER	95 CLE2	< 0.156 (90% CL)
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43 HUANG 05 uses both  $e$  and  $\mu$  events, and makes a small correction to the  $\mu$  events to make them effectively  $e$  events. This result gives  $|\frac{V_{cd}}{V_{cs}} \cdot \frac{f_+^\pi(0)}{f_+^K(0)}|^2 = 0.038^{+0.006+0.005}_{-0.007-0.003}$ .

44 FRABETTI 96B uses both  $e$  and  $\mu$  events, and makes a small correction to the  $\mu$  events to make them effectively  $e$  events. This result gives  $|\frac{V_{cd}}{V_{cs}} \cdot \frac{f_+^\pi(0)}{f_+^K(0)}|^2 = 0.050 \pm 0.011 \pm 0.002$ .

45 BUTLER 95 has  $87 \pm 33 \pi^-e^+\nu_e$  events. The result gives  $|\frac{V_{cd}}{V_{cs}} \cdot \frac{f_+^\pi(0)}{f_+^K(0)}|^2 = 0.052 \pm 0.020 \pm 0.007$ .

$\Gamma(\pi^-\mu^+\nu_\mu)/\Gamma_{\text{total}}$	$\Gamma_{30}/\Gamma$			
<u>VALUE (units <math>10^{-2}</math>)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.236±0.024 OUR FIT</b>				
<b>0.231±0.026±0.019</b>	106 ± 13	WIDHALM	06	BELL $e^+e^- \approx \gamma(4S)$
$\Gamma(\pi^-\mu^+\nu_\mu)/\Gamma(K^-\mu^+\nu_\mu)$	$\Gamma_{30}/\Gamma_{19}$			
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.072±0.007 OUR FIT</b>				
<b>0.074±0.008±0.007</b>	288 ± 29	46 LINK	05	FOCS $\gamma A, \bar{E}_\gamma \approx 180 \text{ GeV}$
46 LINK 05 finds the form-factor ratio $ f_0^\pi(0)/f_0^K(0) $ to be $0.85 \pm 0.04 \pm 0.04 \pm 0.01$ .				
$\Gamma(\rho^-\epsilon^+\nu_e)/\Gamma_{\text{total}}$	$\Gamma_{31}/\Gamma$			
<u>VALUE (units <math>10^{-2}</math>)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.194±0.039±0.013</b>	31 ± 6	COAN	05	CLEO $e^+e^-$ at $\psi(3770)$

———— Hadronic modes with a single  $\bar{K}$  ———

$\Gamma(K^-\pi^+)/\Gamma_{\text{total}}$	$\Gamma_{32}/\Gamma$			
<u>VALUE (units <math>10^{-2}</math>)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>3.82±0.07 OUR FIT</b>	Error includes scale factor of 1.1.			
<b>3.85±0.07 OUR AVERAGE</b>				
3.91±0.08±0.09	10.3k ± 100	47 HE	05 CLEO	$e^+e^-$ at $\psi(3770)$
3.82±0.07±0.12		48 ARTUSO	98 CLE2	CLEO average
3.90±0.09±0.12	5392	49 BARATE	97C ALEP	From $Z$ decays
3.41±0.12±0.28	1173 ± 37	49 ALBRECHT	94F ARG	$e^+e^- \approx \gamma(4S)$
3.62±0.34±0.44		49 DECOMP	91J ALEP	From $Z$ decays
• • • We do not use the following data for averages, fits, limits, etc. • • •				
3.81±0.15±0.16	1165	50 ARTUSO	98 CLE2	$e^+e^-$ at $\gamma(4S)$
3.69±0.11±0.16		51 COAN	98 CLE2	See ARTUSO 98
4.5 ± 0.6 ± 0.4		52 ALBRECHT	94 ARG	$e^+e^- \approx \gamma(4S)$
3.95±0.08±0.17	4208	49,53 AKERIB	93 CLE2	See ARTUSO 98
4.5 ± 0.8 ± 0.5	56	49 ABACHI	88 HRS	$e^+e^-$ 29 GeV
4.2 ± 0.4 ± 0.4	930	ADLER	88C MRK3	$e^+e^-$ 3.77 GeV
4.1 ± 0.6	263 ± 17	54 SCHINDLER	81 MRK2	$e^+e^-$ 3.771 GeV
4.3 ± 1.0	130	55 PERUZZI	77 MRK1	$e^+e^-$ 3.77 GeV

47 HE 05 uses single- and double-tagged events in an overall fit. The fraction here includes (unobserved) final-state photons.

48 This combines the CLEO results of ARTUSO 98, COAN 98, and AKERIB 93.

49 ABACHI 88, DECOMP 91J, AKERIB 93, ALBRECHT 94F, and BARATE 97C use  $D^*(2010)^+ \rightarrow D^0\pi^+$  decays. The  $\pi^+$  is both slow and of low  $p_T$  with respect to the event thrust axis or nearest jet ( $\approx D^{*+}$  direction). The excess number of such  $\pi^+$ 's over background gives the number of  $D^*(2010)^+ \rightarrow D^0\pi^+$  events, and the fraction with  $D^0 \rightarrow K^-\pi^+$  gives the  $D^0 \rightarrow K^-\pi^+$  branching fraction.

50 ARTUSO 98, following ALBRECHT 94, uses  $D^0$  mesons from  $\bar{B}^0 \rightarrow D^*(2010)^+ X \ell^-\bar{\nu}_\ell$  decays. Our average uses the CLEO average of this value with the values of COAN 98 and AKERIB 93.

51 COAN 98 assumes that  $\Gamma(B \rightarrow \bar{D}X\ell^+\nu)/\Gamma(B \rightarrow X\ell^+\nu) = 1.0 - 3|V_{ub}/V_{cb}|^2 - 0.010 \pm 0.005$ , the last term accounting for  $\bar{B} \rightarrow D_s^+ K X \ell^-\bar{\nu}$ . COAN 98 is included in the CLEO average in ARTUSO 98.

<sup>52</sup> ALBRECHT 94 uses  $D^0$  mesons from  $\bar{B}^0 \rightarrow D^{*+} \ell^- \bar{\nu}_\ell$  decays. This is a different set of events than used by ALBRECHT 94F.

<sup>53</sup> This AKERIB 93 value includes radiative corrections; without them, the value is  $0.0391 \pm 0.0008 \pm 0.0017$ . AKERIB 93 is included in the CLEO average in ARTUSO 98.

<sup>54</sup> SCHINDLER 81 (MARK-2) measures  $\sigma(e^+ e^- \rightarrow \psi(3770)) \times$  branching fraction to be  $0.24 \pm 0.02$  nb. We use the MARK-3 (ADLER 88C) value of  $\sigma = 5.8 \pm 0.5 \pm 0.6$  nb.

<sup>55</sup> PERUZZI 77 (MARK-1) measures  $\sigma(e^+ e^- \rightarrow \psi(3770)) \times$  branching fraction to be  $0.25 \pm 0.05$  nb. We use the MARK-3 (ADLER 88C) value of  $\sigma = 5.8 \pm 0.5 \pm 0.6$  nb.

$\Gamma(K_S^0 \pi^0)/\Gamma(K^- \pi^+)$	$\Gamma_{33}/\Gamma_{32}$			
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.297±0.031 OUR FIT</b>				
<b>0.68 ± 0.12 ± 0.11</b>	119	ANJOS	92B E691	$\gamma$ Be 80–240 GeV

$\Gamma(K_S^0 \pi^0)/\Gamma(K_S^0 \pi^+ \pi^-)$	$\Gamma_{33}/\Gamma_{34}$			
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.393±0.033 OUR FIT</b>		Error includes scale factor of 1.1.		
<b>0.378±0.033 OUR AVERAGE</b>				

0.44 $\pm 0.02 \pm 0.05$	1942 $\pm 64$	PROCARIO	93B CLE2	$e^+ e^-$ 10.36–10.7 GeV
0.34 $\pm 0.04 \pm 0.02$	92	<sup>56</sup> ALBRECHT	92P ARG	$e^+ e^- \approx 10$ GeV
0.36 $\pm 0.04 \pm 0.08$	104	KINOSHITA	91 CLEO	$e^+ e^- \sim 10.7$ GeV

<sup>56</sup> This value is calculated from numbers in Table 1 of ALBRECHT 92P.

$\Gamma(K_S^0 \pi^+ \pi^-)/\Gamma_{\text{total}}$	$\Gamma_{34}/\Gamma$			
VALUE (units $10^{-2}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
<b>2.88±0.19 OUR FIT</b>				
<b>2.68±0.29 OUR AVERAGE</b>				

2.52 $\pm 0.20 \pm 0.25$	284 $\pm 22$	<sup>57</sup> ALBRECHT	94F ARG	$e^+ e^- \approx \gamma(4S)$
3.2 $\pm 0.3 \pm 0.5$		ADLER	87 MRK3	$e^+ e^-$ 3.77 GeV
<b>• • •</b> We do not use the following data for averages, fits, limits, etc. <b>• • •</b>				
2.6 $\pm 0.8$	32 $\pm 8$	<sup>58</sup> SCHINDLER	81 MRK2	$e^+ e^-$ 3.771 GeV
4.0 $\pm 1.2$	28	<sup>59</sup> PERUZZI	77 MRK1	$e^+ e^-$ 3.77 GeV

<sup>57</sup> See the footnote on the ALBRECHT 94F measurement of  $\Gamma(K^- \pi^+)/\Gamma_{\text{total}}$  for the method used.

<sup>58</sup> SCHINDLER 81 (MARK-2) measures  $\sigma(e^+ e^- \rightarrow \psi(3770)) \times$  branching fraction to be  $0.30 \pm 0.08$  nb. We use the MARK-3 (ADLER 88C) value of  $\sigma = 5.8 \pm 0.5 \pm 0.6$  nb.

<sup>59</sup> PERUZZI 77 (MARK-1) measures  $\sigma(e^+ e^- \rightarrow \psi(3770)) \times$  branching fraction to be  $0.46 \pm 0.12$  nb. We use the MARK-3 (ADLER 88C) value of  $\sigma = 5.8 \pm 0.5 \pm 0.6$  nb.

$\Gamma(K_S^0 \pi^+ \pi^-)/\Gamma(K^- \pi^+)$	$\Gamma_{34}/\Gamma_{32}$			
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.76±0.05 OUR FIT</b>				
<b>0.81±0.05±0.08</b>	856 $\pm 35$	FRAEBETTI	94J E687	$\gamma$ Be $\bar{E}_\gamma=220$ GeV
<b>• • •</b> We do not use the following data for averages, fits, limits, etc. <b>• • •</b>				
0.85 $\pm 0.40$	35	AVERY	80 SPEC	$\gamma N \rightarrow D^{*+}$
1.4 $\pm 0.5$	116	PICCOLO	77 MRK1	$e^+ e^-$ 4.03, 4.41 GeV

### $\Gamma(K_S^0 \rho^0)/\Gamma(K_S^0 \pi^+ \pi^-)$

$\Gamma_{35}/\Gamma_{34}$

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.259<sup>+0.014</sup><sub>-0.023</sub> OUR AVERAGE</b>			Error includes scale factor of 1.1.
0.264 $\pm$ 0.009 <sup>+0.010</sup> <sub>-0.026</sub>	MURAMATSU 02	CLE2	Dalitz fit, 5299 evts
0.350 $\pm$ 0.028 $\pm$ 0.067	FRABETTI 94G	E687	$\gamma$ Be, $\bar{E}_\gamma \approx 220$ GeV
0.227 $\pm$ 0.032 $\pm$ 0.009	ALBRECHT 93D	ARG	$e^+ e^- \approx 10$ GeV
<b>• • • We do not use the following data for averages, fits, limits, etc. • • •</b>			
0.267 $\pm$ 0.011 <sup>+0.009</sup> <sub>-0.028</sub>	ASNER 04A	CLEO	See MURAMATSU 02
0.215 $\pm$ 0.051 $\pm$ 0.037	ANJOS 93	E691	$\gamma$ Be 90–260 GeV
0.20 $\pm$ 0.06 $\pm$ 0.03	FRABETTI 92B	E687	$\gamma$ Be, $\bar{E}_\gamma = 221$ GeV
0.12 $\pm$ 0.01 $\pm$ 0.07	ADLER 87	MRK3	$e^+ e^-$ 3.77 GeV

### $\Gamma(K_S^0 \omega, \omega \rightarrow \pi^+ \pi^-)/\Gamma(K_S^0 \pi^+ \pi^-)$

$\Gamma_{36}/\Gamma_{34}$

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.0072<sup>+0.0018</sup><sub>-0.0009</sub> OUR AVERAGE</b>	MURAMATSU 02	CLE2	Dalitz fit, 5299 evts
<b>• • • We do not use the following data for averages, fits, limits, etc. • • •</b>			
0.0081 $\pm$ 0.0019 <sup>+0.0018</sup> <sub>-0.0010</sub>	ASNER 04A	CLEO	See MURAMATSU 02

### $\Gamma(K_S^0 f_0(980), f_0(980) \rightarrow \pi^+ \pi^-)/\Gamma(K_S^0 \pi^+ \pi^-)$

$\Gamma_{37}/\Gamma_{34}$

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.047<sup>+0.010</sup><sub>-0.007</sub> OUR AVERAGE</b>			
0.043 $\pm$ 0.005 <sup>+0.012</sup> <sub>-0.006</sub>	MURAMATSU 02	CLE2	Dalitz fit, 5299 evts
0.068 $\pm$ 0.016 $\pm$ 0.018	FRABETTI 94G	E687	$\gamma$ Be, $\bar{E}_\gamma \approx 220$ GeV
0.046 $\pm$ 0.018 $\pm$ 0.006	ALBRECHT 93D	ARG	$e^+ e^- \approx 10$ GeV
<b>• • • We do not use the following data for averages, fits, limits, etc. • • •</b>			
0.042 $\pm$ 0.005 <sup>+0.011</sup> <sub>-0.005</sub>	ASNER 04A	CLEO	See MURAMATSU 02

### $\Gamma(K_S^0 f_2(1270), f_2(1270) \rightarrow \pi^+ \pi^-)/\Gamma(K_S^0 \pi^+ \pi^-)$

$\Gamma_{38}/\Gamma_{34}$

This is the "fit fraction" from the Dalitz-plot analysis. Note the large difference between the CLEO results and earlier measurements.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.0045<sup>+0.0039</sup><sub>-0.0022</sub> OUR AVERAGE</b>			
0.0027 $\pm$ 0.0015 <sup>+0.0037</sup> <sub>-0.0017</sub>	MURAMATSU 02	CLE2	Dalitz fit, 5299 evts
0.037 $\pm$ 0.014 $\pm$ 0.017	FRABETTI 94G	E687	$\gamma$ Be, $\bar{E}_\gamma \approx 220$ GeV
0.050 $\pm$ 0.021 $\pm$ 0.008	ALBRECHT 93D	ARG	$e^+ e^- \approx 10$ GeV
<b>• • • We do not use the following data for averages, fits, limits, etc. • • •</b>			
0.0036 $\pm$ 0.0022 <sup>+0.0032</sup> <sub>-0.0019</sub>	ASNER 04A	CLEO	See MURAMATSU 02

$\Gamma(K_S^0 f_0(1370), f_0(1370) \rightarrow \pi^+ \pi^-)/\Gamma(K_S^0 \pi^+ \pi^-)$   $\Gamma_{39}/\Gamma_{34}$

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.085<sup>+0.019</sup><sub>-0.021</sub> OUR AVERAGE</b>			
0.099 $\pm 0.011^{+0.028}_{-0.044}$	MURAMATSU 02	CLE2	Dalitz fit, 5299 evts
0.077 $\pm 0.022^{+0.031}_{-0.031}$	FRABETTI 94G	E687	$\gamma$ Be, $\bar{E}_\gamma \approx 220$ GeV
0.082 $\pm 0.028^{+0.013}_{-0.013}$	ALBRECHT 93D	ARG	$e^+ e^- \approx 10$ GeV
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$			
0.098 $\pm 0.014^{+0.026}_{-0.036}$	ASNER 04A	CLEO	See MURAMATSU 02

$\Gamma(K^*(892)^- \pi^+, K^*(892)^- \rightarrow K_S^0 \pi^-)/\Gamma(K_S^0 \pi^+ \pi^-)$   $\Gamma_{40}/\Gamma_{34}$

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.660<sup>+0.019</sup><sub>-0.026</sub> OUR AVERAGE</b>			
0.657 $\pm 0.013^{+0.018}_{-0.040}$	MURAMATSU 02	CLE2	Dalitz fit, 5299 evts
0.625 $\pm 0.036^{+0.026}_{-0.026}$	FRABETTI 94G	E687	$\gamma$ Be, $\bar{E}_\gamma \approx 220$ GeV
0.718 $\pm 0.042^{+0.030}_{-0.030}$	ALBRECHT 93D	ARG	$e^+ e^- \approx 10$ GeV
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$			
0.663 $\pm 0.013^{+0.024}_{-0.043}$	ASNER 04A	CLEO	See MURAMATSU 02
0.480 $\pm 0.097$	ANJOS 93	E691	$\gamma$ Be 90–260 GeV
0.56 $\pm 0.04$ $\pm 0.05$	ADLER 87	MRK3	$e^+ e^-$ 3.77 GeV

$\Gamma(K^*(892)^+ \pi^-, K^*(892)^+ \rightarrow K_S^0 \pi^+)/\Gamma(K_S^0 \pi^+ \pi^-)$   $\Gamma_{191}/\Gamma_{34}$

This is the "fit fraction" from the Dalitz-plot analysis. This is a doubly Cabibbo-suppressed mode.

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
<b>3.4<math>\pm 1.3^{+4.1}_{-0.4}</math></b>	MURAMATSU 02	CLE2	Dalitz fit, 5299 evts
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$			
3.4 $\pm 1.3^{+3.6}_{-0.5}$	ASNER 04A	CLEO	See MURAMATSU 02

$\Gamma(K_0^*(1430)^- \pi^+, K_0^*(1430)^- \rightarrow K_S^0 \pi^-)/\Gamma(K_S^0 \pi^+ \pi^-)$   $\Gamma_{42}/\Gamma_{34}$

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.096<sup>+0.021</sup><sub>-0.012</sub> OUR AVERAGE</b>			
0.073 $\pm 0.007^{+0.031}_{-0.011}$	MURAMATSU 02	CLE2	Dalitz fit, 5299 evts
0.109 $\pm 0.027^{+0.029}_{-0.029}$	FRABETTI 94G	E687	$\gamma$ Be, $\bar{E}_\gamma \approx 220$ GeV
0.129 $\pm 0.034^{+0.021}_{-0.021}$	ALBRECHT 93D	ARG	$e^+ e^- \approx 10$ GeV
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$			
0.072 $\pm 0.007^{+0.014}_{-0.013}$	ASNER 04A	CLEO	See MURAMATSU 02

$\Gamma(K_2^*(1430)^-\pi^+, K_2^*(1430)^-\rightarrow K_S^0\pi^-)/\Gamma(K_S^0\pi^+\pi^-)$   $\Gamma_{43}/\Gamma_{34}$

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
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**0.011±0.002<sup>+0.007</sup><sub>-0.003</sub>** MURAMATSU 02 CLE2 Dalitz fit, 5299 evts

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.011\pm 0.002^{+0.005}_{-0.003}$  ASNER 04A CLEO See MURAMATSU 02

$\Gamma(K^*(1680)^-\pi^+, K^*(1680)^-\rightarrow K_S^0\pi^-)/\Gamma(K_S^0\pi^+\pi^-)$   $\Gamma_{44}/\Gamma_{34}$

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
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**0.022±0.004<sup>+0.018</sup><sub>-0.015</sub>** MURAMATSU 02 CLE2 Dalitz fit, 5299 evts

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.023\pm 0.005^{+0.007}_{-0.014}$  ASNER 04A CLEO See MURAMATSU 02

$\Gamma(K_S^0\pi^+\pi^- \text{ nonresonant})/\Gamma(K_S^0\pi^+\pi^-)$   $\Gamma_{45}/\Gamma_{34}$

This is the "fit fraction" from the Dalitz-plot analysis. Neither FRABETTI 94G nor ALBRECHT 93D (quoted in many of the earlier submodes of  $K_S^0\pi^+\pi^-$ ) sees evidence for a nonresonant component.

VALUE	DOCUMENT ID	TECN	COMMENT
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**0.009±0.004<sup>+0.020</sup><sub>-0.004</sub>** MURAMATSU 02 CLE2 Dalitz fit, 5299 evts

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.007\pm 0.007^{+0.021}_{-0.006}$  ASNER 04A CLEO See MURAMATSU 02

$0.263\pm 0.024\pm 0.041$  ANJOS 93 E691  $\gamma$ Be 90–260 GeV

$0.26 \pm 0.08 \pm 0.05$  FRABETTI 92B E687  $\gamma$  Be,  $\bar{E}_\gamma = 221$  GeV

$0.33 \pm 0.05 \pm 0.10$  ADLER 87 MRK3  $e^+e^-$  3.77 GeV

$\Gamma(K^-\pi^+\pi^0)/\Gamma_{\text{total}}$   $\Gamma_{46}/\Gamma$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
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**0.135±0.006 OUR FIT** Error includes scale factor of 1.6.

**0.149±0.003±0.005**  $19k \pm 150$   ${}^{60}\text{HE}$  05 CLEO  $e^+e^-$  at  $\psi(3770)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.133\pm 0.012\pm 0.013$  931 ADLER 88C MRK3  $e^+e^-$  3.77 GeV

$0.117\pm 0.043$  37 SCHINDLER 81 MRK2  $e^+e^-$  3.771 GeV

${}^{60}\text{HE}$  05 uses single- and double-tagged events in an overall fit. The fraction here includes (unobserved) final-state photons.

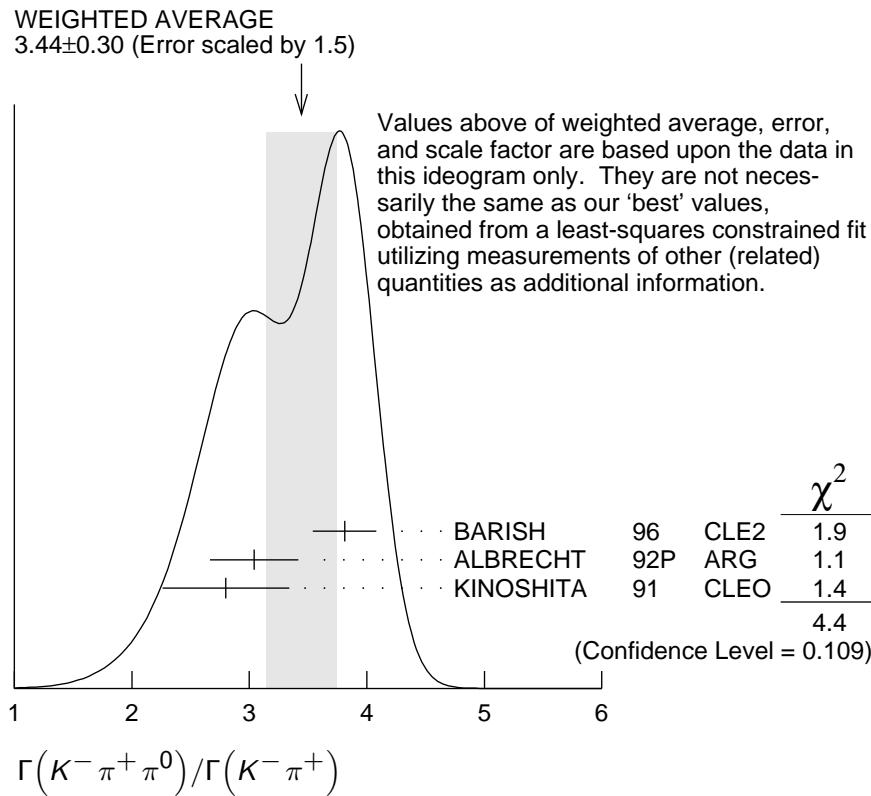
<sup>61</sup>SCHINDLER 81 (MARK-2) measures  $\sigma(e^+e^- \rightarrow \psi(3770)) \times$  branching fraction to be  $0.68 \pm 0.23$  nb. We use the MARK-3 (ADLER 88C) value of  $\sigma = 5.8 \pm 0.5 \pm 0.6$  nb.

### $\Gamma(K^-\pi^+\pi^0)/\Gamma(K^-\pi^+)$

$\Gamma_{46}/\Gamma_{32}$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b><math>3.54 \pm 0.16</math> OUR FIT</b>	Error includes scale factor of 2.0.			
<b><math>3.44 \pm 0.30</math> OUR AVERAGE</b>	Error includes scale factor of 1.5. See the ideogram below.			
3.81 $\pm 0.07 \pm 0.26$	10k	BARISH	96	CLE2 $e^+ e^- \approx \gamma(4S)$
3.04 $\pm 0.16 \pm 0.34$	931	ALBRECHT	92P	ARG $e^+ e^- \approx 10$ GeV
2.8 $\pm 0.14 \pm 0.52$	1050	KINOSHITA	91	CLEO $e^+ e^- \sim 10.7$ GeV
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$				
4.0 $\pm 0.9 \pm 1.0$	69	ALVAREZ	91B	NA14 Photoproduction
4.2 $\pm 1.4$	41	SUMMERS	84	E691 Photoproduction

<sup>62</sup> This value is calculated from numbers in Table 1 of ALBRECHT 92P.



### $\Gamma(K^-\rho^+)/\Gamma(K^-\pi^+\pi^0)$

$\Gamma_{47}/\Gamma_{46}$

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>0.78 \pm 0.04</math> OUR AVERAGE</b>			
0.788 $\pm 0.019 \pm 0.048$	KOPP 01	CLE2	$e^+ e^- \approx 10.6$ GeV
0.765 $\pm 0.041 \pm 0.054$	FRABETTI 94G	E687	$\gamma Be, \bar{E}_\gamma \approx 220$ GeV
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$			
0.647 $\pm 0.039 \pm 0.150$	ANJOS 93	E691	$\gamma Be$ 90–260 GeV
0.81 $\pm 0.03 \pm 0.06$	ADLER 87	MRK3	$e^+ e^-$ 3.77 GeV

### $\Gamma(K^-\rho(1700)^+, \rho(1700)^+ \rightarrow \pi^+\pi^0)/\Gamma(K^-\pi^+\pi^0)$

$\Gamma_{48}/\Gamma_{46}$

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>0.057 \pm 0.008 \pm 0.009</math></b>	KOPP 01	CLE2	$e^+ e^- \approx 10.6$ GeV

$\Gamma(K^*(892)^-\pi^+, K^*(892)^-\rightarrow K^-\pi^0)/\Gamma(K^-\pi^+\pi^0)$   $\Gamma_{49}/\Gamma_{46}$

This is the “fit fraction” from the Dalitz-plot analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.160<sup>+0.025</sup><sub>-0.013</sub> OUR AVERAGE</b>			
0.161 $\pm$ 0.007 <sup>+0.027</sup> <sub>-0.011</sub>	KOPP 01	CLE2	$e^+e^- \approx 10.6$ GeV
0.148 $\pm$ 0.028 $\pm$ 0.049	FRABETTI 94G E687	$\gamma$ Be, $\bar{E}_\gamma$	$\approx 220$ GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.084 $\pm$ 0.011 $\pm$ 0.012	ANJOS 93	E691	$\gamma$ Be 90–260 GeV
0.12 $\pm$ 0.02 $\pm$ 0.03	ADLER 87	MRK3	$e^+e^-$ 3.77 GeV

$\Gamma(\bar{K}^*(892)^0\pi^0, \bar{K}^*(892)^0\rightarrow K^-\pi^+)/\Gamma(K^-\pi^+\pi^0)$   $\Gamma_{50}/\Gamma_{46}$

This is the “fit fraction” from the Dalitz-plot analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.135<math>\pm</math>0.016 OUR AVERAGE</b>			
0.127 $\pm$ 0.009 $\pm$ 0.016	KOPP 01	CLE2	$e^+e^- \approx 10.6$ GeV
0.165 $\pm$ 0.031 $\pm$ 0.015	FRABETTI 94G E687	$\gamma$ Be, $\bar{E}_\gamma$	$\approx 220$ GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.142 $\pm$ 0.018 $\pm$ 0.024	ANJOS 93	E691	$\gamma$ Be 90–260 GeV
0.13 $\pm$ 0.02 $\pm$ 0.03	ADLER 87	MRK3	$e^+e^-$ 3.77 GeV

$\Gamma(K_0^*(1430)^-\pi^+, K_0^*(1430)^-\rightarrow K^-\pi^0)/\Gamma(K^-\pi^+\pi^0)$   $\Gamma_{51}/\Gamma_{46}$

This is the “fit fraction” from the Dalitz-plot analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.033<math>\pm</math>0.006<math>\pm</math>0.014</b>			
KOPP 01	CLE2	$e^+e^- \approx 10.6$ GeV	

$\Gamma(\bar{K}_0^*(1430)^0\pi^0, \bar{K}_0^*(1430)^0\rightarrow K^-\pi^+)/\Gamma(K^-\pi^+\pi^0)$   $\Gamma_{52}/\Gamma_{46}$

This is the “fit fraction” from the Dalitz-plot analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.041<math>\pm</math>0.006<sup>+0.032</sup><sub>-0.009</sub></b>			
KOPP 01	CLE2	$e^+e^- \approx 10.6$ GeV	

$\Gamma(K^*(1680)^-\pi^+, K^*(1680)^-\rightarrow K^-\pi^0)/\Gamma(K^-\pi^+\pi^0)$   $\Gamma_{53}/\Gamma_{46}$

This is the “fit fraction” from the Dalitz-plot analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.013<math>\pm</math>0.003<math>\pm</math>0.004</b>			
KOPP 01	CLE2	$e^+e^- \approx 10.6$ GeV	

$\Gamma(K^-\pi^+\pi^0 \text{ nonresonant})/\Gamma(K^-\pi^+\pi^0)$   $\Gamma_{54}/\Gamma_{46}$

This is the “fit fraction” from the Dalitz-plot analysis.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.080<sup>+0.038</sup><sub>-0.014</sub> OUR AVERAGE</b>				
0.075 $\pm$ 0.009 <sup>+0.056</sup> <sub>-0.011</sub>	KOPP 01	CLE2	$e^+e^- \approx 10.6$ GeV	
0.101 $\pm$ 0.033 $\pm$ 0.040	FRABETTI 94G E687	$\gamma$ Be, $\bar{E}_\gamma$	$\approx 220$ GeV	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.036 $\pm$ 0.004 $\pm$ 0.018	ANJOS 93	E691	$\gamma$ Be 90–260 GeV	
0.09 $\pm$ 0.02 $\pm$ 0.04	ADLER 87	MRK3	$e^+e^-$ 3.77 GeV	
0.51 $\pm$ 0.22	21	SUMMERS 84	E691	Photoproduction

$\Gamma(\bar{K}^*(892)^0 \pi^0, \bar{K}^*(892)^0 \rightarrow K_S^0 \pi^0)/\Gamma(K_S^0 \pi^0)$				$\Gamma_{56}/\Gamma_{33}$
VALUE	DOCUMENT ID	TECN	COMMENT	
$0.55^{+0.13}_{-0.10} \pm 0.07$	PROCARIO	93B	CLE2	Dalitz plot fit, 122 evts
$\Gamma(K_S^0 \pi^0 \pi^0 \text{ nonresonant})/\Gamma(K_S^0 \pi^0)$				$\Gamma_{57}/\Gamma_{33}$
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
$0.37 \pm 0.08 \pm 0.04$	76	PROCARIO	93B	CLE2

$\Gamma(K^- \pi^+ \pi^+ \pi^-)/\Gamma_{\text{total}}$				$\Gamma_{58}/\Gamma$
VALUE (units $10^{-2}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
$7.70 \pm 0.25$ OUR FIT	Error includes scale factor of 1.2.			

**8.0 ± 0.4 OUR AVERAGE** Error includes scale factor of 1.3. See the ideogram below.

8.3 ± 0.2 ± 0.3	15k ± 130	<sup>63</sup> HE	05 CLEO	$e^+ e^-$ at $\psi(3770)$
7.9 ± 1.5 ± 0.9		<sup>64</sup> ALBRECHT	94 ARG	$e^+ e^- \approx \gamma(4S)$
$6.80 \pm 0.27 \pm 0.57$	$1430 \pm 52$	<sup>65</sup> ALBRECHT	94F ARG	$e^+ e^- \approx \gamma(4S)$
9.1 ± 0.8 ± 0.8	992	ADLER	88C MRK3	$e^+ e^-$ 3.77 GeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

11.7 ± 2.5	185	<sup>66</sup> SCHINDLER	81 MRK2	$e^+ e^-$ 3.771 GeV
6.2 ± 1.9	44	<sup>67</sup> PERUZZI	77 MRK1	$e^+ e^-$ 3.77 GeV

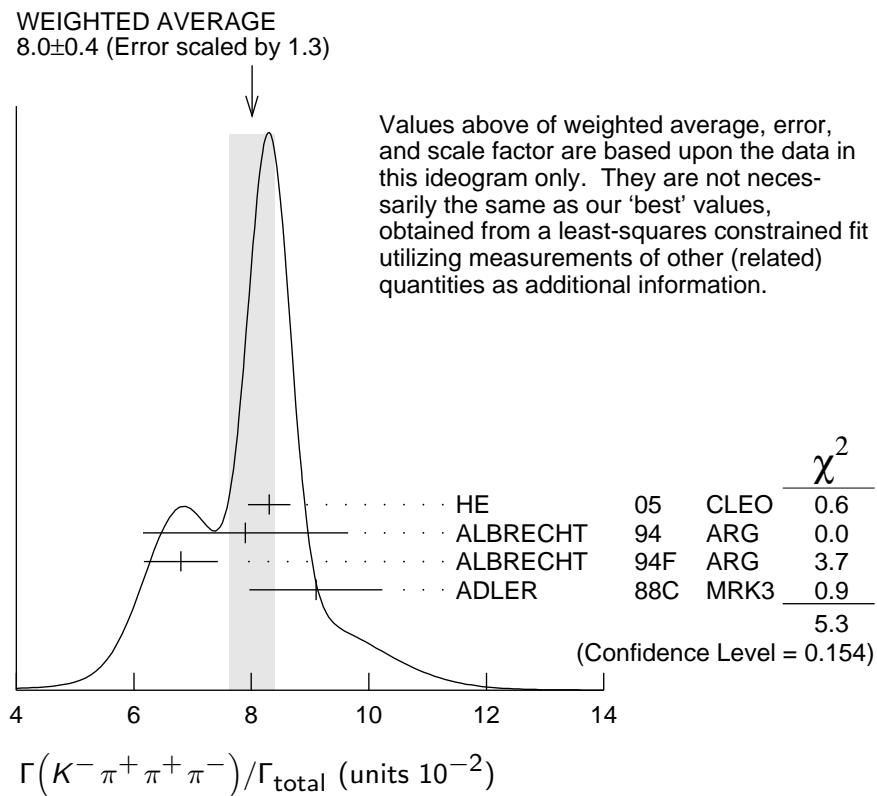
<sup>63</sup> HE 05 uses single- and double-tagged events in an overall fit. The fraction here includes (unobserved) final-state photons.

<sup>64</sup> ALBRECHT 94 uses  $D^0$  mesons from  $\bar{B}^0 \rightarrow D^*+ \ell^- \bar{\nu}_\ell$  decays. This is a different set of events than used by ALBRECHT 94F.

<sup>65</sup> See the footnote on the ALBRECHT 94F measurement of  $\Gamma(K^- \pi^+)/\Gamma_{\text{total}}$  for the method used.

<sup>66</sup> SCHINDLER 81 (MARK-2) measures  $\sigma(e^+ e^- \rightarrow \psi(3770)) \times$  branching fraction to be  $0.68 \pm 0.11$  nb. We use the MARK-3 (ADLER 88C) value of  $\sigma = 5.8 \pm 0.5 \pm 0.6$  nb.

<sup>67</sup> PERUZZI 77 (MARK-1) measures  $\sigma(e^+ e^- \rightarrow \psi(3770)) \times$  branching fraction to be  $0.36 \pm 0.10$  nb. We use the MARK-3 (ADLER 88C) value of  $\sigma = 5.8 \pm 0.5 \pm 0.6$  nb.



### $\Gamma(K^-\pi^+\pi^+\pi^-)/\Gamma(K^-\pi^+)$

### $\Gamma_{58}/\Gamma_{32}$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
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**2.02±0.06 OUR FIT** Error includes scale factor of 1.3.

**1.97±0.09 OUR AVERAGE**

$1.94 \pm 0.07^{+0.09}_{-0.11}$	JUN	00	SELX	$\Sigma^-$ nucleus, 600 GeV
$1.7 \pm 0.2 \pm 0.2$	1745	ANJOS	92C E691	$\gamma$ Be 90–260 GeV
$1.90 \pm 0.25 \pm 0.20$	337	ALVAREZ	91B NA14	Photoproduction
$2.12 \pm 0.16 \pm 0.09$		BORTOLETTI088	CLEO	$e^+e^-$ 10.55 GeV
$2.17 \pm 0.28 \pm 0.23$		ALBRECHT	85F ARG	$e^+e^-$ 10 GeV
<b>• • • We do not use the following data for averages, fits, limits, etc. • • •</b>				
$2.0 \pm 0.9$	48	BAILEY	86 ACCM	$\pi^-$ Be fixed target
$2.0 \pm 1.0$	10	BAILEY	83B SPEC	$\pi^-$ Be $\rightarrow D^0$
$2.2 \pm 0.8$	214	PICCOLO	77 MRK1	$e^+e^-$ 4.03, 4.41 GeV

### $\Gamma(K^-\pi^+\rho^0_{\text{total}})/\Gamma(K^-\pi^+\pi^-)$

### $\Gamma_{59}/\Gamma_{58}$

This includes  $K^- a_1(1260)^+$ ,  $\bar{K}^*(892)^0 \rho^0$ , etc. The next entry gives the specifically 3-body fraction. We rely on the MARK III and E691 full amplitude analyses of the  $K^-\pi^+\pi^-\pi^-$  channel for values of the resonant substructure.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.835±0.035 OUR AVERAGE</b>			
$0.80 \pm 0.03 \pm 0.05$	ANJOS	92C E691	$\gamma$ Be 90–260 GeV
$0.855 \pm 0.032 \pm 0.030$	COFFMAN	92B MRK3	$e^+e^-$ 3.77 GeV
<b>• • • We do not use the following data for averages, fits, limits, etc. • • •</b>			
$0.98 \pm 0.12 \pm 0.10$	ALVAREZ	91B NA14	Photoproduction

### $\Gamma(K^-\pi^+\rho^0\text{3-body})/\Gamma(K^-\pi^+\pi^+\pi^-)$

$\Gamma_{60}/\Gamma_{58}$

We rely on the MARK III and E691 full amplitude analyses of the  $K^-\pi^+\pi^+\pi^-$  channel for values of the resonant substructure.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.063±0.028 OUR AVERAGE</b>				
0.05 ± 0.03 ± 0.02		ANJOS	92C	E691 $\gamma$ Be 90–260 GeV
0.084±0.022±0.04		COFFMAN	92B	MRK3 $e^+e^-$ 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.77 ± 0.06 ± 0.06	68	ALVAREZ	91B	NA14 Photoproduction
0.85 $^{+0.11}_{-0.22}$	180	PICCOLO	77	MRK1 $e^+e^-$ 4.03, 4.41 GeV

<sup>68</sup> This value is for  $\rho^0$  ( $K^-\pi^+$ )-nonresonant. ALVAREZ 91B cannot determine what fraction of this is  $K^-\pi_1(1260)^+$ .

### $\Gamma(\bar{K}^*(892)^0\rho^0)/\Gamma(K^-\pi^+\pi^+\pi^-)$

$\Gamma_{97}/\Gamma_{58}$

Unseen decay modes of the  $\bar{K}^*(892)^0$  are included. We rely on the MARK III and E691 full amplitude analyses of the  $K^-\pi^+\pi^+\pi^-$  channel for values of the resonant substructure.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.195±0.03±0.03</b>				
		ANJOS	92C	E691 $\gamma$ Be 90–260 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.34 ± 0.09 ± 0.09		ALVAREZ	91B	NA14 Photoproduction
0.75 ± 0.3	5	BAILEY	83B	SPEC $\pi$ Be → $D^0$
0.15 $^{+0.16}_{-0.15}$	20	PICCOLO	77	MRK1 $e^+e^-$ 4.03, 4.41 GeV

### $\Gamma(\bar{K}^*(892)^0\rho^0\text{transverse})/\Gamma(K^-\pi^+\pi^+\pi^-)$

$\Gamma_{98}/\Gamma_{58}$

Unseen decay modes of the  $\bar{K}^*(892)^0$  are included.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.20 ± 0.07 OUR FIT</b>			
<b>0.213±0.024±0.075</b>	COFFMAN	92B	MRK3 $e^+e^-$ 3.77 GeV

### $\Gamma(\bar{K}^*(892)^0\rho^0S\text{-wave})/\Gamma(K^-\pi^+\pi^+\pi^-)$

$\Gamma_{99}/\Gamma_{58}$

Unseen decay modes of the  $\bar{K}^*(892)^0$  are included.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.375±0.045±0.06</b>			

### $\Gamma(\bar{K}^*(892)^0\rho^0S\text{-wave long.})/\Gamma_{\text{total}}$

$\Gamma_{100}/\Gamma$

Unseen decay modes of the  $\bar{K}^*(892)^0$  are included.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.003	90	COFFMAN	92B	MRK3 $e^+e^-$ 3.77 GeV

### $\Gamma(\bar{K}^*(892)^0\rho^0P\text{-wave})/\Gamma_{\text{total}}$

$\Gamma_{101}/\Gamma$

Unseen decay modes of the  $\bar{K}^*(892)^0$  are included.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.003	90	COFFMAN	92B	MRK3 $e^+e^-$ 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.009	90	ANJOS	92C	E691 $\gamma$ Be 90–260 GeV

$\Gamma(\bar{K}^*(892)^0 \rho^0 D\text{-wave})/\Gamma(K^- \pi^+ \pi^+ \pi^-)$   $\Gamma_{102}/\Gamma_{58}$

Unseen decay modes of the  $\bar{K}^*(892)^0$  are included.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>0.255 \pm 0.045 \pm 0.06</math></b>		ANJOS	92C E691	$\gamma$ Be 90–260 GeV

$\Gamma(K^- \pi^+ f_0(980))/\Gamma_{\text{total}}$   $\Gamma_{107}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$				
<0.011	90	ANJOS	92C E691	$\gamma$ Be 90–260 GeV

$\Gamma(\bar{K}^*(892)^0 f_0(980))/\Gamma_{\text{total}}$   $\Gamma_{108}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$				
<0.007	90	ANJOS	92C E691	$\gamma$ Be 90–260 GeV

$\Gamma(K^- a_1(1260)^+)/\Gamma(K^- \pi^+ \pi^+ \pi^-)$   $\Gamma_{92}/\Gamma_{58}$

Unseen decay modes of the  $a_1(1260)^+$  are included, assuming that the  $a_1(1260)^+$  decays entirely to  $\rho\pi$  [or at least to  $(\pi\pi)_{I=1}\pi$ ].

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>0.97 \pm 0.14</math> OUR AVERAGE</b>				
0.94 $\pm 0.13 \pm 0.20$		ANJOS	92C E691	$\gamma$ Be 90–260 GeV
$0.984 \pm 0.048 \pm 0.16$		COFFMAN	92B MRK3	$e^+ e^-$ 3.77 GeV

$\Gamma(K^- a_2(1320)^+)/\Gamma_{\text{total}}$   $\Gamma_{94}/\Gamma$

Unseen decay modes of the  $a_2(1320)^+$  are included.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.002</b>	90	ANJOS	92C E691	$\gamma$ Be 90–260 GeV
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$				
<0.006	90	COFFMAN	92B MRK3	$e^+ e^-$ 3.77 GeV

$\Gamma(K_1(1270)^- \pi^+)/\Gamma(K^- \pi^+ \pi^+ \pi^-)$   $\Gamma_{109}/\Gamma_{58}$

Unseen decay modes of the  $K_1(1270)^-$  are included. The MARK3 and E691 experiments disagree considerably here.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>0.14 \pm 0.04</math> OUR FIT</b>				
<b><math>0.194 \pm 0.056 \pm 0.088</math></b>		COFFMAN	92B MRK3	$e^+ e^-$ 3.77 GeV
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$				
<0.013	90	ANJOS	92C E691	$\gamma$ Be 90–260 GeV

$\Gamma(K_1(1400)^- \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{110}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.012</b>	90	COFFMAN	92B MRK3	$e^+ e^-$ 3.77 GeV

$\Gamma(K^*(1410)^- \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{112}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$				
<0.012	90	COFFMAN	92B MRK3	$e^+ e^-$ 3.77 GeV

$\Gamma(\bar{K}^*(892)^0 \pi^+ \pi^- \text{total})/\Gamma(K^- \pi^+ \pi^+ \pi^-)$   $\Gamma_{95}/\Gamma_{58}$

This includes  $\bar{K}^*(892)^0 \rho^0$ , etc. The next entry gives the specifically 3-body fraction.  
Unseen decay modes of the  $\bar{K}^*(892)^0$  are included.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.30 ± 0.06 ± 0.03</b>	ANJOS	92C E691	$\gamma$ Be 90–260 GeV

$\Gamma(\bar{K}^*(892)^0 \pi^+ \pi^- \text{3-body})/\Gamma(K^- \pi^+ \pi^+ \pi^-)$   $\Gamma_{96}/\Gamma_{58}$

Unseen decay modes of the  $\bar{K}^*(892)^0$  are included.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.19 ± 0.04 OUR FIT</b>			
<b>0.18 ± 0.04 OUR AVERAGE</b>			

0.165 ± 0.03 ± 0.045 ANJOS 92C E691  $\gamma$  Be 90–260 GeV  
0.210 ± 0.027 ± 0.06 COFFMAN 92B MRK3  $e^+ e^-$  3.77 GeV

$\Gamma(K^- \pi^+ \pi^+ \pi^- \text{nonresonant})/\Gamma(K^- \pi^+ \pi^+ \pi^-)$   $\Gamma_{66}/\Gamma_{58}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.233 ± 0.032 OUR AVERAGE</b>			

0.23 ± 0.02 ± 0.03 ANJOS 92C E691  $\gamma$  Be 90–260 GeV  
0.242 ± 0.025 ± 0.06 COFFMAN 92B MRK3  $e^+ e^-$  3.77 GeV

$\Gamma(K_S^0 \pi^+ \pi^- \pi^0)/\Gamma_{\text{total}}$   $\Gamma_{67}/\Gamma$

VALUE (units $10^{-2}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
<b>5.3 ± 0.6 OUR FIT</b>				

**5.2 ± 1.1 ± 1.2** 140 COFFMAN 92B MRK3  $e^+ e^-$  3.77 GeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

$6.7^{+1.6}_{-1.7}$  <sup>69</sup> BARLAG 92C ACCM  $\pi^-$  Cu 230 GeV

<sup>69</sup> BARLAG 92C computes the branching fraction using topological normalization.

$\Gamma(K_S^0 \pi^+ \pi^- \pi^0)/\Gamma(K_S^0 \pi^+ \pi^-)$   $\Gamma_{67}/\Gamma_{34}$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>1.83 ± 0.20 OUR FIT</b>				
<b>1.86 ± 0.23 OUR AVERAGE</b>				

1.80 ± 0.20 ± 0.21 190 <sup>70</sup> ALBRECHT 92P ARG  $e^+ e^- \approx 10$  GeV  
2.8 ± 0.8 ± 0.8 46 ANJOS 92C E691  $\gamma$  Be 90–260 GeV  
1.85 ± 0.26 ± 0.30 158 KINOSHITA 91 CLEO  $e^+ e^- \sim 10.7$  GeV

<sup>70</sup> This value is calculated from numbers in Table 1 of ALBRECHT 92P.

$\Gamma(K_S^0 \eta)/\Gamma(K_S^0 \pi^0)$   $\Gamma_{89}/\Gamma_{33}$

Unseen decay modes of the  $\eta$  are included.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.33 ± 0.04 OUR FIT</b>				
<b>0.32 ± 0.04 ± 0.03</b>	225 ± 30	PROCARIO	93B CLE2	$\eta \rightarrow \gamma\gamma$

$\Gamma(K_S^0 \eta)/\Gamma(K_S^0 \pi^+ \pi^-)$   $\Gamma_{89}/\Gamma_{34}$

Unseen decay modes of the  $\eta$  are included.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.130 ± 0.018 OUR FIT</b>				
<b>0.14 ± 0.02 ± 0.02</b>	80 ± 12	PROCARIO	93B CLE2	$\eta \rightarrow \pi^+ \pi^- \pi^0$

### $\Gamma(K_S^0 \omega)/\Gamma(K^- \pi^+)$

Unseen decay modes of the  $\omega$  are included.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.29±0.05 OUR FIT</b>			
<b>0.50±0.18±0.10</b>	ALBRECHT	89D ARG	$e^+ e^-$ 10 GeV

### $\Gamma_{90}/\Gamma_{32}$

### $\Gamma(K_S^0 \omega)/\Gamma(K_S^0 \pi^+ \pi^-)$

Unseen decay modes of the  $\omega$  are included.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.38±0.07 OUR FIT</b>				
<b>0.33±0.09 OUR AVERAGE</b>	16	71 ALBRECHT	92P ARG	$e^+ e^- \approx$ 10 GeV

### $\Gamma_{90}/\Gamma_{34}$

### $\Gamma(K_S^0 \omega)/\Gamma(K_S^0 \pi^+ \pi^- \pi^0)$

Unseen decay modes of the  $\omega$  are included.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.21 ±0.04 OUR FIT</b>			
<b>0.220±0.048±0.0116</b>	COFFMAN	92B MRK3	$e^+ e^-$ 3.77 GeV

### $\Gamma_{90}/\Gamma_{67}$

### $\Gamma(K_S^0 \eta'(958))/\Gamma(K_S^0 \pi^+ \pi^-)$

Unseen decay modes of the  $\eta'(958)$  are included.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.32±0.04 OUR AVERAGE</b>				
0.31±0.02±0.04	594	PROCARIO	93B CLE2	$\eta' \rightarrow \eta \pi^+ \pi^-$ , $\rho^0 \gamma$
0.37±0.13±0.06	18	72 ALBRECHT	92P ARG	$e^+ e^- \approx$ 10 GeV

### $\Gamma_{91}/\Gamma_{34}$

72 This value is calculated from numbers in Table 1 of ALBRECHT 92P.

### $\Gamma(K^*(892)^- \rho^+)/\Gamma(K_S^0 \pi^+ \pi^- \pi^0)$

Unseen decay modes of the  $K^*(892)^-$  are included.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>1.212±0.376±0.252</b>	COFFMAN	92B MRK3	$e^+ e^-$ 3.77 GeV

### $\Gamma_{103}/\Gamma_{67}$

### $\Gamma(K^*(892)^- \rho^+ \text{ longitudinal})/\Gamma(K_S^0 \pi^+ \pi^- \pi^0)$

Unseen decay modes of the  $K^*(892)^-$  are included.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.580±0.222</b>	COFFMAN	92B MRK3	$e^+ e^-$ 3.77 GeV

### $\Gamma_{104}/\Gamma_{67}$

### $\Gamma(K^*(892)^- \rho^+ \text{ transverse})/\Gamma(K_S^0 \pi^+ \pi^- \pi^0)$

Unseen decay modes of the  $K^*(892)^-$  are included.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.634±0.360</b>	COFFMAN	92B MRK3	$e^+ e^-$ 3.77 GeV

### $\Gamma_{105}/\Gamma_{67}$

### $\Gamma(K^*(892)^- \rho^+ P\text{-wave})/\Gamma_{\text{total}}$

Unseen decay modes of the  $K^*(892)^-$  are included.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.015</b>	90	73 COFFMAN	92B MRK3	$e^+ e^-$ 3.77 GeV

### $\Gamma_{106}/\Gamma$

73 Obtained using other  $\bar{K}^*(892)^- \rho$  P-wave limits and isospin relations.

$\Gamma(\bar{K}^*(892)^0 \rho^0 \text{transverse})/\Gamma(K_S^0 \pi^+ \pi^- \pi^0)$   $\Gamma_{98}/\Gamma_{67}$ 
Unseen decay modes of the  $\bar{K}^*(892)^0$  are included.

VALUE		DOCUMENT ID	TECN	COMMENT
<b>0.30 ± 0.11 OUR FIT</b>				
<b>0.252 ± 0.222</b>		COFFMAN	92B MRK3	$e^+ e^-$ 3.77 GeV

 $\Gamma(K^0 a_1(1260)^0)/\Gamma_{\text{total}}$   $\Gamma_{93}/\Gamma$ 
Unseen decay modes of the  $a_1(1260)^+$  are included, assuming that the  $a_1(1260)^+$  decays entirely to  $\rho\pi$  [or at least to  $(\pi\pi)_{I=1}\pi$ ].

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.019	90	COFFMAN	92B MRK3	$e^+ e^-$ 3.77 GeV

 $\Gamma(K_1(1270)^- \pi^+)/\Gamma(K_S^0 \pi^+ \pi^- \pi^0)$   $\Gamma_{109}/\Gamma_{67}$ 
Unseen decay modes of the  $K_1(1270)^-$  are included.

VALUE		DOCUMENT ID	TECN	COMMENT
<b>0.21 ± 0.06 OUR FIT</b>				
<b>0.20 ± 0.06</b>		COFFMAN	92B MRK3	$e^+ e^-$ 3.77 GeV

 $\Gamma(\bar{K}_1(1400)^0 \pi^0)/\Gamma_{\text{total}}$   $\Gamma_{111}/\Gamma$ 

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.037	90	COFFMAN	92B MRK3	$e^+ e^-$ 3.77 GeV

 $\Gamma(\bar{K}^*(892)^0 \pi^+ \pi^- \text{3-body})/\Gamma(K_S^0 \pi^+ \pi^- \pi^0)$   $\Gamma_{96}/\Gamma_{67}$ 
Unseen decay modes of the  $\bar{K}^*(892)^0$  are included.

VALUE		DOCUMENT ID	TECN	COMMENT
<b>0.28 ± 0.07 OUR FIT</b>	Error includes scale factor of 1.1.			
<b>0.382 ± 0.210</b>		COFFMAN	92B MRK3	$e^+ e^-$ 3.77 GeV

 $\Gamma(K_S^0 \pi^+ \pi^- \pi^0 \text{nonresonant})/\Gamma(K_S^0 \pi^+ \pi^- \pi^0)$   $\Gamma_{73}/\Gamma_{67}$ 

VALUE		DOCUMENT ID	TECN	COMMENT
<b>0.210 ± 0.147 ± 0.150</b>		COFFMAN	92B MRK3	$e^+ e^-$ 3.77 GeV

 $\Gamma(K^- \pi^+ \pi^0 \pi^0)/\Gamma_{\text{total}}$   $\Gamma_{74}/\Gamma$ 

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.177 ± 0.029		74 BARLAG	92C ACCM	$\pi^-$ Cu 230 GeV
0.149 ± 0.037 ± 0.030	24	75 ADLER	88C MRK3	$e^+ e^-$ 3.77 GeV
0.209 ± 0.074 ± 0.012	9	74 AGUILAR-...	87F HYBR	$\pi p, pp$ 360, 400 GeV

<sup>74</sup> AGUILAR-BENITEZ 87F and BARLAG 92C compute the branching fraction using topological normalization. They do not distinguish the presence of a third  $\pi^0$ , and thus are not included in the average.

<sup>75</sup> ADLER 88C uses an absolute normalization method finding this decay channel opposite a detected  $\bar{D}^0 \rightarrow K^+ \pi^-$  in pure  $D\bar{D}$  events.

 $\Gamma(K^- \pi^+ \pi^+ \pi^- \pi^0)/\Gamma(K^- \pi^+)$   $\Gamma_{75}/\Gamma_{32}$ 

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>1.07 ± 0.10 OUR FIT</b>				
<b>0.98 ± 0.11 ± 0.11</b>	225	<sup>76</sup> ALBRECHT	92P ARG	$e^+ e^-$ ≈ 10 GeV

<sup>76</sup> This value is calculated from numbers in Table 1 of ALBRECHT 92P.

$\Gamma(K^-\pi^+\pi^+\pi^-\pi^0)/\Gamma(K^-\pi^+\pi^+\pi^-)$   $\Gamma_{75}/\Gamma_{58}$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.53±0.05 OUR FIT</b>				
<b>0.56±0.07 OUR AVERAGE</b>				
$0.55 \pm 0.07^{+0.12}_{-0.09}$	167	KINOSHITA 91	CLEO	$e^+e^- \sim 10.7$ GeV
$0.57 \pm 0.06 \pm 0.05$	180	ANJOS 90D	E691	Photoproduction

$\Gamma(\bar{K}^*(892)^0\pi^+\pi^-\pi^0)/\Gamma(K^-\pi^+\pi^+\pi^-\pi^0)$   $\Gamma_{113}/\Gamma_{75}$

Unseen decay modes of the  $\bar{K}^*(892)^0$  are included.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.45±0.15±0.15</b>		ANJOS 90D	E691	Photoproduction

$\Gamma(\bar{K}^*(892)^0\eta)/\Gamma(K^-\pi^+)$   $\Gamma_{114}/\Gamma_{32}$

Unseen decay modes of the  $\bar{K}^*(892)^0$  and  $\eta$  are included.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				

$0.58 \pm 0.19^{+0.24}_{-0.28}$	46	KINOSHITA 91	CLEO	$e^+e^- \sim 10.7$ GeV
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$\Gamma(\bar{K}^*(892)^0\eta)/\Gamma(K^-\pi^+\pi^0)$   $\Gamma_{114}/\Gamma_{46}$

Unseen decay modes of the  $\bar{K}^*(892)^0$  and  $\eta$  are included.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				

$0.13 \pm 0.02 \pm 0.03$	214	PROCARIO 93B	CLE2	$\bar{K}^*{}^0\eta \rightarrow K^-\pi^+/\gamma\gamma$
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$\Gamma(K_S^0\eta\pi^0)/\Gamma(K_S^0\pi^0)$   $\Gamma_{79}/\Gamma_{33}$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.46±0.07±0.06</b>	$155 \pm 22$	77 RUBIN 04	CLEO	$e^+e^- \approx 10$ GeV

77 The  $\eta$  here is detected in its  $\gamma\gamma$  mode, but other  $\eta$  modes are included in the value given.

$\Gamma(K_S^0a_0(980), a_0(980) \rightarrow \eta\pi^0)/\Gamma(K_S^0\eta\pi^0)$   $\Gamma_{80}/\Gamma_{79}$

This is the “fit fraction” from the Dalitz-plot analysis, with interference.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>1.19±0.09±0.26</b>		78 RUBIN 04	CLEO	Dalitz fit, 155 evts

78 In addition to  $K_S^0a_0(980)$  and  $\bar{K}^*(892)^0\eta$  modes, RUBIN 04 finds a fit fraction of  $0.246 \pm 0.092 \pm 0.091$  for other, undetermined modes.

$\Gamma(\bar{K}^*(892)^0\eta, \bar{K}^*(892)^0 \rightarrow K_S^0\pi^0)/\Gamma(K_S^0\eta\pi^0)$   $\Gamma_{81}/\Gamma_{79}$

This is the “fit fraction” from the Dalitz-plot analysis, with interference.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.293±0.062±0.035</b>		79 RUBIN 04	CLEO	Dalitz fit, 155 evts

79 See the note on RUBIN 04 in the preceding data block.

$\Gamma(K^-\pi^+\omega)/\Gamma(K^-\pi^+)$   $\Gamma_{115}/\Gamma_{32}$

Unseen decay modes of the  $\omega$  are included.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.78±0.12±0.10</b>	99	80 ALBRECHT 92P	ARG	$e^+e^- \approx 10$ GeV

80 This value is calculated from numbers in Table 1 of ALBRECHT 92P.

$\Gamma(\bar{K}^*(892)^0 \omega)/\Gamma(K^- \pi^+)$  $\Gamma_{116}/\Gamma_{32}$ Unseen decay modes of the  $\bar{K}^*(892)^0$  and  $\omega$  are included.

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.28±0.11±0.04</b>	17	81 ALBRECHT	92P ARG	$e^+ e^- \approx 10 \text{ GeV}$

81 This value is calculated from numbers in Table 1 of ALBRECHT 92P.

 $\Gamma(K^- \pi^+ \eta'(958))/\Gamma(K^- \pi^+ \pi^+ \pi^-)$  $\Gamma_{117}/\Gamma_{58}$ Unseen decay modes of the  $\eta'(958)$  are included.

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.093±0.014±0.019</b>	286	PROCARIO	93B CLE2	$\eta' \rightarrow \eta \pi^+ \pi^- , \rho^0 \gamma$

 $\Gamma(\bar{K}^*(892)^0 \eta'(958))/\Gamma(K^- \pi^+ \eta'(958))$  $\Gamma_{118}/\Gamma_{117}$ Unseen decay modes of the  $\bar{K}^*(892)^0$  are included.

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
<b>&lt;0.15</b>	90	PROCARIO	93B CLE2

 $\Gamma(K_S^0 2\pi^+ 2\pi^-)/\Gamma(K_S^0 \pi^+ \pi^-)$  $\Gamma_{82}/\Gamma_{34}$ 

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.095±0.005±0.007</b>	1283 ± 57	LINK	04D FOCS	$\gamma A, \bar{E}_\gamma \approx 180 \text{ GeV}$

• • • We do not use the following data for averages, fits, limits, etc. • • •

0.07 ± 0.02 ± 0.01	11	82 ALBRECHT	92P ARG	$e^+ e^- \approx 10 \text{ GeV}$
0.149 ± 0.026	56	AMMAR	91 CLEO	$e^+ e^- \approx 10.5 \text{ GeV}$
0.18 ± 0.07 ± 0.04	6	ANJOS	90D E691	Photoproduction

82 This value is calculated from numbers in Table 1 of ALBRECHT 92P.

 $\Gamma(K_S^0 \rho^0 \pi^+ \pi^-, \text{no } K^*(892)^-)/\Gamma(K_S^0 2\pi^+ 2\pi^-)$  $\Gamma_{83}/\Gamma_{82}$ 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.40±0.24±0.07</b>	LINK	04D FOCS	$\gamma A, \bar{E}_\gamma \approx 180 \text{ GeV}$

 $\Gamma(K^*(892)^- \pi^+ \pi^+ \pi^-, K^*(892)^- \rightarrow K_S^0 \pi^- , \text{no } \rho^0)/\Gamma(K_S^0 2\pi^+ 2\pi^-)$  $\Gamma_{84}/\Gamma_{82}$ 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.17±0.28±0.02</b>	LINK	04D FOCS	$\gamma A, \bar{E}_\gamma \approx 180 \text{ GeV}$

 $\Gamma(K^*(892)^- \rho^0 \pi^+, K^*(892)^- \rightarrow K_S^0 \pi^-)/\Gamma(K_S^0 2\pi^+ 2\pi^-)$  $\Gamma_{85}/\Gamma_{82}$ 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.60±0.21±0.09</b>	LINK	04D FOCS	$\gamma A, \bar{E}_\gamma \approx 180 \text{ GeV}$

 $\Gamma(K_S^0 2\pi^+ 2\pi^- \text{ nonresonant})/\Gamma(K_S^0 2\pi^+ 2\pi^-)$  $\Gamma_{86}/\Gamma_{82}$ 

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>&lt;0.46</b>	90	LINK	04D FOCS	$\gamma A, \bar{E}_\gamma \approx 180 \text{ GeV}$

 $\Gamma(K^- 3\pi^+ 2\pi^-)/\Gamma(K^- \pi^+ \pi^+ \pi^-)$  $\Gamma_{88}/\Gamma_{58}$ 

<u>VALUE (units <math>10^{-3}</math>)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>2.70±0.58±0.38</b>	48 ± 10	LINK	04B FOCS	$\gamma A, \bar{E}_\gamma \approx 180 \text{ GeV}$

———— Hadronic modes with three  $K$ 's ——

$$\Gamma(K_S^0 K^+ K^-)/\Gamma(K_S^0 \pi^+ \pi^-)$$

$$\Gamma_{119}/\Gamma_{34}$$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.158±0.001±0.005</b>	14k±116	AUBERT,B	05J BABR	$e^+ e^- \approx \gamma(4S)$
<b>• • •</b> We do not use the following data for averages, fits, limits, etc. <b>• • •</b>				
0.20 ± 0.05 ± 0.04	47	FRABETTI	92B E687	$\gamma$ Be, $\bar{E}_\gamma = 221$ GeV
0.170±0.022	136	AMMAR	91 CLEO	$e^+ e^- \approx 10.5$ GeV
0.24 ± 0.08		BEBEK	86 CLEO	$e^+ e^-$ near $\gamma(4S)$
0.185±0.055	52	ALBRECHT	85B ARG	$e^+ e^-$ 10 GeV

$$\Gamma(K_S^0 a_0(980)^0, a_0^0 \rightarrow K^+ K^-)/\Gamma(K_S^0 K^+ K^-)$$

$$\Gamma_{120}/\Gamma_{119}$$

This is the “fit fraction” from the Dalitz-plot analysis, with interference.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.664±0.016±0.070</b>	AUBERT,B	05J BABR	Dalitz fit, 12540 ± 112 evts

$$\Gamma(K^- a_0(980)^+, a_0^+ \rightarrow K^+ K_S^0)/\Gamma(K_S^0 K^+ K^-)$$

$$\Gamma_{121}/\Gamma_{119}$$

This is the “fit fraction” from the Dalitz-plot analysis, with interference.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.134±0.011±0.037</b>	AUBERT,B	05J BABR	Dalitz fit, 12540 ± 112 evts

$$\Gamma(K^+ a_0(980)^-, a_0^- \rightarrow K^- K_S^0)/\Gamma(K_S^0 K^+ K^-)$$

$$\Gamma_{122}/\Gamma_{119}$$

This is a doubly Cabibbo-suppressed mode.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.025</b>	95	AUBERT,B	05J BABR	Dalitz fit, 12540 ± 112 evts

$$\Gamma(K_S^0 f_0(980), f_0 \rightarrow K^+ K^-)/\Gamma(K_S^0 K^+ K^-)$$

$$\Gamma_{123}/\Gamma_{119}$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.021</b>	95	AUBERT,B	05J BABR	Dalitz fit, 12540 ± 112 evts

$$\Gamma(K_S^0 \phi, \phi \rightarrow K^+ K^-)/\Gamma(K_S^0 K^+ K^-)$$

$$\Gamma_{124}/\Gamma_{119}$$

This is the “fit fraction” from the Dalitz-plot analysis, with interference.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.459±0.007±0.007</b>	AUBERT,B	05J BABR	Dalitz fit, 12540 ± 112 evts

$$\Gamma(K_S^0 f_0(1400), f_0 \rightarrow K^+ K^-)/\Gamma(K_S^0 K^+ K^-)$$

$$\Gamma_{125}/\Gamma_{119}$$

This is the “fit fraction” from the Dalitz-plot analysis, with interference.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.038±0.007±0.023</b>	AUBERT,B	05J BABR	Dalitz fit, 12540 ± 112 evts

$$\Gamma(3K_S^0)/\Gamma(K_S^0 \pi^+ \pi^-)$$

$$\Gamma_{126}/\Gamma_{34}$$

VALUE (units $10^{-2}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
<b>3.2 ± 0.4 OUR AVERAGE</b>				
3.58±0.54±0.52	170 ± 26	LINK	05A FOCS	$\gamma$ Be, $\bar{E}_\gamma \approx 180$ GeV
2.78±0.38±0.48	61	ASNER	96B CLE2	$e^+ e^- \approx \gamma(4S)$
7.0 ± 2.4 ± 1.2	10 ± 3	FRABETTI	94J E687	$\gamma$ Be, $\bar{E}_\gamma = 220$ GeV
3.2 ± 1.0	22	AMMAR	91 CLEO	$e^+ e^- \approx 10.5$ GeV
3.4 ± 1.4 ± 1.0	5	ALBRECHT	90C ARG	$e^+ e^- \approx 10$ GeV

$\Gamma(K^+ K^- \bar{K}^*(892)^0)/\Gamma(K^+ \pi^+ \pi^-)$   $\Gamma_{127}/\Gamma_{58}$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.0027 ± 0.0004 OUR AVERAGE</b>	Error includes scale factor of 1.1.			
0.00257 ± 0.00034 ± 0.00024	143	LINK	03G FOCS	$\gamma$ A, $\bar{E}_\gamma \approx 180$ GeV
0.0054 ± 0.0016 ± 0.0008	18	AITALA	01D E791	$\pi^-$ A, 500 GeV
0.0028 ± 0.0007 ± 0.0001	20	FRABETTI	95C E687	$\gamma$ Be, $\bar{E}_\gamma \approx 200$ GeV

$\Gamma(\phi \bar{K}^*(892)^0, \phi \rightarrow K^+ K^-, \bar{K}^*(892)^0 \rightarrow K^- \pi^+)/\Gamma(K^+ K^- K^- \pi^+)$   $\Gamma_{130}/\Gamma_{127}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.48 ± 0.06 ± 0.01</b>	LINK	03G FOCS	$\gamma$ A, $\bar{E}_\gamma \approx 180$ GeV

$\Gamma(K^- \pi^+ \phi, \phi \rightarrow K^+ K^-)/\Gamma(K^+ K^- K^- \pi^+)$   $\Gamma_{129}/\Gamma_{127}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.18 ± 0.06 ± 0.04</b>	LINK	03G FOCS	$\gamma$ A, $\bar{E}_\gamma \approx 180$ GeV

$\Gamma(K^+ K^- \bar{K}^*(892)^0, \bar{K}^*(892)^0 \rightarrow K^- \pi^+)/\Gamma(K^+ K^- K^- \pi^+)$   $\Gamma_{128}/\Gamma_{127}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.20 ± 0.07 ± 0.02</b>	LINK	03G FOCS	$\gamma$ A, $\bar{E}_\gamma \approx 180$ GeV

$\Gamma(K^+ K^- K^- \pi^+ \text{nonresonant})/\Gamma(K^+ K^- K^- \pi^+)$   $\Gamma_{131}/\Gamma_{127}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.15 ± 0.06 ± 0.02</b>	LINK	03G FOCS	$\gamma$ A, $\bar{E}_\gamma \approx 180$ GeV

$\Gamma(K_S^0 K_S^0 K^\pm \pi^\mp)/\Gamma(K_S^0 \pi^+ \pi^-)$   $\Gamma_{132}/\Gamma_{34}$

VALUE (units $10^{-2}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
<b>2.12 ± 0.38 ± 0.20</b>	57 ± 10	LINK	05A FOCS	$\gamma$ Be, $\bar{E}_\gamma \approx 180$ GeV

————— Pionic modes ————

$\Gamma(\pi^+ \pi^-)/\Gamma(K^- \pi^+)$   $\Gamma_{133}/\Gamma_{32}$

VALUE (units $10^{-2}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
<b>3.59 ± 0.05 OUR AVERAGE</b>				

3.62 ± 0.10 ± 0.08	2085 ± 54	RUBIN	06 CLEO	$e^+ e^-$ at $\psi(3770)$
3.594 ± 0.054 ± 0.040	7334 ± 97	ACOSTA	05C CDF	$p\bar{p}$ , $\sqrt{s} = 1.96$ TeV
3.53 ± 0.12 ± 0.06	3453	LINK	03 FOCS	$\gamma$ A, $\bar{E}_\gamma \approx 180$ GeV
3.51 ± 0.16 ± 0.17	710	CSORNA	02 CLE2	$e^+ e^- \approx \gamma(4S)$
4.0 ± 0.2 ± 0.3	2043	AITALA	98C E791	$\pi^-$ A, 500 GeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

3.4 ± 0.7 ± 0.1	76 ± 15	ABLIKIM	05F BES	$e^+ e^- \approx \psi(3770)$
4.3 ± 0.7 ± 0.3	177	FRABETTI	94C E687	$\gamma$ Be $\bar{E}_\gamma = 220$ GeV
3.48 ± 0.30 ± 0.23	227	SELEN	93 CLE2	$e^+ e^- \approx \gamma(4S)$
5.5 ± 0.8 ± 0.5	120	ANJOS	91D E691	Photoproduction
5.0 ± 0.7 ± 0.5	110	ALEXANDER	90 CLEO	$e^+ e^-$ 10.5–11 GeV

$\Gamma(\pi^0\pi^0)/\Gamma(K^-\pi^+)$

$\Gamma_{134}/\Gamma_{32}$

VALUE (units $10^{-2}$ )	EVTS
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**2.07±0.19 OUR AVERAGE**

$2.05 \pm 0.13 \pm 0.16$	$499 \pm 32$
$2.2 \pm 0.4 \pm 0.4$	40

DOCUMENT ID

TECN

COMMENT

RUBIN

06

CLEO  $e^+e^-$  at  $\psi(3770)$

SELEN

93

CLE2  $e^+e^- \approx \gamma(4S)$

$\Gamma(\pi^+\pi^-\pi^0)/\Gamma(K^-\pi^+\pi^0)$

$\Gamma_{135}/\Gamma_{32}$

VALUE (units $10^{-2}$ )	EVTS
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**37.1±2.0 OUR FIT** Error includes scale factor of 2.3.

**34.4±0.5±1.2**

$11k \pm 164$

DOCUMENT ID

TECN

COMMENT

RUBIN

06

CLEO  $e^+e^-$  at  $\psi(3770)$

$\Gamma(\pi^+\pi^-\pi^0)/\Gamma(K^-\pi^+\pi^0)$

$\Gamma_{135}/\Gamma_{46}$

VALUE (units $10^{-2}$ )	EVTS
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**10.5 ± 0.4 OUR FIT** Error includes scale factor of 2.9.

**10.59±0.06±0.13**

$60k \pm 343$

DOCUMENT ID

TECN

COMMENT

AUBERT,B

06X

BABR  $e^+e^- \approx \gamma(4S)$

$\Gamma(\rho^+\pi^-)/\Gamma(\pi^+\pi^-\pi^0)$

$\Gamma_{136}/\Gamma_{135}$

This is the “fit fraction” from the Dalitz-plot analysis, with interference.

VALUE
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DOCUMENT ID

TECN

COMMENT

**0.763±0.019±0.025**

CRONIN-HEN..05

CLEO

$e^+e^- \approx 10 \text{ GeV}$

$\Gamma(\rho^0\pi^0)/\Gamma(\pi^+\pi^-\pi^0)$

$\Gamma_{137}/\Gamma_{135}$

This is the “fit fraction” from the Dalitz-plot analysis, with interference.

VALUE
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DOCUMENT ID

TECN

COMMENT

**0.244±0.020±0.021**

CRONIN-HEN..05

CLEO

$e^+e^- \approx 10 \text{ GeV}$

$\Gamma(\rho^-\pi^+)/\Gamma(\pi^+\pi^-\pi^0)$

$\Gamma_{138}/\Gamma_{135}$

This is the “fit fraction” from the Dalitz-plot analysis, with interference.

VALUE
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DOCUMENT ID

TECN

COMMENT

**0.345±0.024±0.013**

CRONIN-HEN..05

CLEO

$e^+e^- \approx 10 \text{ GeV}$

$\Gamma(f_0(980)\pi^0, f_0(980) \rightarrow \pi^+\pi^-)/\Gamma(\pi^+\pi^-\pi^0)$

$\Gamma_{139}/\Gamma_{135}$

VALUE	CL%
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DOCUMENT ID

TECN

COMMENT

**<2.6 × 10<sup>-4</sup>**

95

83

CRONIN-HEN..05

CLEO

$e^+e^- \approx 10 \text{ GeV}$

<sup>83</sup> The CRONIN-HENNESSY 05 fit here includes, in addition to the three  $\rho\pi$  charged states, only the  $f_0(980)\pi^0$  mode. See also the next entries for limits obtained in the same way for the  $f_0(600)\pi^0$  mode and for an  $S$ -wave  $\pi^+\pi^-$  parametrized using a  $K$ -matrix. Our  $\rho\pi$  branching ratios, given above, use the fit with the  $K$ -matrix  $S$  wave.

$\Gamma(f_0(600)\pi^0, f_0(600) \rightarrow \pi^+\pi^-)/\Gamma(\pi^+\pi^-\pi^0)$

$\Gamma_{140}/\Gamma_{135}$

The  $f_0(600)$  is the  $\sigma$ .

VALUE	CL%
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DOCUMENT ID

TECN

COMMENT

**<2.1 × 10<sup>-3</sup>**

95

84

CRONIN-HEN..05

CLEO

$e^+e^- \approx 10 \text{ GeV}$

<sup>84</sup> See the note on CRONIN-HENNESSY 05 in the proceeding data block.

$\Gamma((\pi^+\pi^-)S\text{-wave}\pi^0)/\Gamma(\pi^+\pi^-\pi^0)$

$\Gamma_{141}/\Gamma_{135}$

VALUE	CL%
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DOCUMENT ID

TECN

COMMENT

**<0.019**

95

85

CRONIN-HEN..05

CLEO

$e^+e^- \approx 10 \text{ GeV}$

<sup>85</sup> See the note on CRONIN-HENNESSY 05 two data blocks up.

$\Gamma(3\pi^0)/\Gamma_{\text{total}}$		$\Gamma_{142}/\Gamma$			
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
<b><math>&lt;3.5 \times 10^{-4}</math></b>	90	RUBIN	06	CLEO	$e^+ e^-$ at $\psi(3770)$
$\Gamma(2\pi^+ 2\pi^-)/\Gamma(K^- \pi^+)$				$\Gamma_{143}/\Gamma_{32}$	
<u>VALUE (units <math>10^{-2}</math>)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
<b><math>19.2 \pm 0.6</math> OUR FIT</b>		RUBIN	06	CLEO	$e^+ e^-$ at $\psi(3770)$
<b><math>19.1 \pm 0.4 \pm 0.6</math></b>	$7331 \pm 130$				
$\Gamma(2\pi^+ 2\pi^-)/\Gamma(K^- \pi^+ \pi^+ \pi^-)$				$\Gamma_{143}/\Gamma_{58}$	
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
<b><math>0.095 \pm 0.004</math> OUR FIT</b>	Error includes scale factor of 1.1.				
<b><math>0.096 \pm 0.005</math> OUR AVERAGE</b>					
0.079 $\pm 0.018 \pm 0.005$	162	ABLIKIM	05F	BES	$e^+ e^- \approx \psi(3770)$
0.095 $\pm 0.007 \pm 0.002$	814	FRABETTI	95C	E687	$\gamma Be, \bar{E}_\gamma \approx 200$ GeV
0.115 $\pm 0.023 \pm 0.016$	64	ADAMOVICH	92	OMEG	$\pi^- 340$ GeV
0.108 $\pm 0.024 \pm 0.008$	79	FRABETTI	92	E687	$\gamma Be$
0.102 $\pm 0.013$	345	<sup>86</sup> AMMAR	91	CLEO	$e^+ e^- \approx 10.5$ GeV
0.096 $\pm 0.018 \pm 0.007$	66	ANJOS	91	E691	$\gamma Be$ 80–240 GeV
<sup>86</sup> AMMAR 91 finds $1.25 \pm 0.25 \pm 0.25$ $\rho^0$ 's per $\pi^+ \pi^+ \pi^- \pi^-$ decay, but can't untangle the resonant substructure ( $\rho^0 \rho^0$ , $a_1^\pm \pi^\mp$ , $\rho^0 \pi^+ \pi^-$ ).					
$\Gamma(\pi^+ \pi^- 2\pi^0)/\Gamma(K^- \pi^+)$				$\Gamma_{144}/\Gamma_{32}$	
<u>VALUE (units <math>10^{-2}</math>)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
<b><math>25.8 \pm 1.5 \pm 1.8</math></b>	$2724 \pm 166$	RUBIN	06	CLEO	$e^+ e^-$ at $\psi(3770)$
$\Gamma(\eta \pi^0)/\Gamma(K^- \pi^+)$				$\Gamma_{145}/\Gamma_{32}$	
Unseen decay modes of the $\eta$ are included.					
<u>VALUE (units <math>10^{-2}</math>)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
<b><math>1.47 \pm 0.34 \pm 0.11</math></b>	$62 \pm 14$	RUBIN	06	CLEO	$e^+ e^-$ at $\psi(3770)$
$\Gamma(\omega \pi^0)/\Gamma_{\text{total}}$				$\Gamma_{146}/\Gamma$	
Unseen decay modes of the $\omega$ are included.					
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
<b><math>&lt;2.6 \times 10^{-4}</math></b>	90	RUBIN	06	CLEO	$e^+ e^-$ at $\psi(3770)$
$\Gamma(2\pi^+ 2\pi^- \pi^0)/\Gamma(K^- \pi^+)$				$\Gamma_{147}/\Gamma_{32}$	
<u>VALUE (units <math>10^{-2}</math>)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
<b><math>10.7 \pm 1.2 \pm 0.5</math></b>	$1614 \pm 171$	RUBIN	06	CLEO	$e^+ e^-$ at $\psi(3770)$
$\Gamma(\eta \pi^+ \pi^-)/\Gamma_{\text{total}}$				$\Gamma_{148}/\Gamma$	
Unseen decay modes of the $\eta$ are included.					
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
<b><math>&lt;1.9 \times 10^{-3}</math></b>	90	RUBIN	06	CLEO	$e^+ e^-$ at $\psi(3770)$
$\Gamma(\omega \pi^+ \pi^-)/\Gamma(K^- \pi^+)$				$\Gamma_{149}/\Gamma_{32}$	
Unseen decay modes of the $\omega$ are included.					
<u>VALUE (units <math>10^{-2}</math>)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
<b><math>4.1 \pm 1.2 \pm 0.4</math></b>	$472 \pm 132$	RUBIN	06	CLEO	$e^+ e^-$ at $\psi(3770)$

$\Gamma(3\pi^+ 3\pi^-)/\Gamma(K^- \pi^+ \pi^+ \pi^-)$

$\Gamma_{150}/\Gamma_{58}$

<u>VALUE</u> (units $10^{-3}$ )	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>5.23±0.59±1.35</b>	$149 \pm 17$	LINK	04B FOCS	$\gamma A, \bar{E}_\gamma \approx 180$ GeV

$\Gamma(3\pi^+ 3\pi^-)/\Gamma(K^- 3\pi^+ 2\pi^-)$

$\Gamma_{150}/\Gamma_{88}$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$1.93 \pm 0.47 \pm 0.48$	87	LINK	04B FOCS	$\gamma A, \bar{E}_\gamma \approx 180$ GeV
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87 This LINK 04B result is not independent of other results in these Listings.

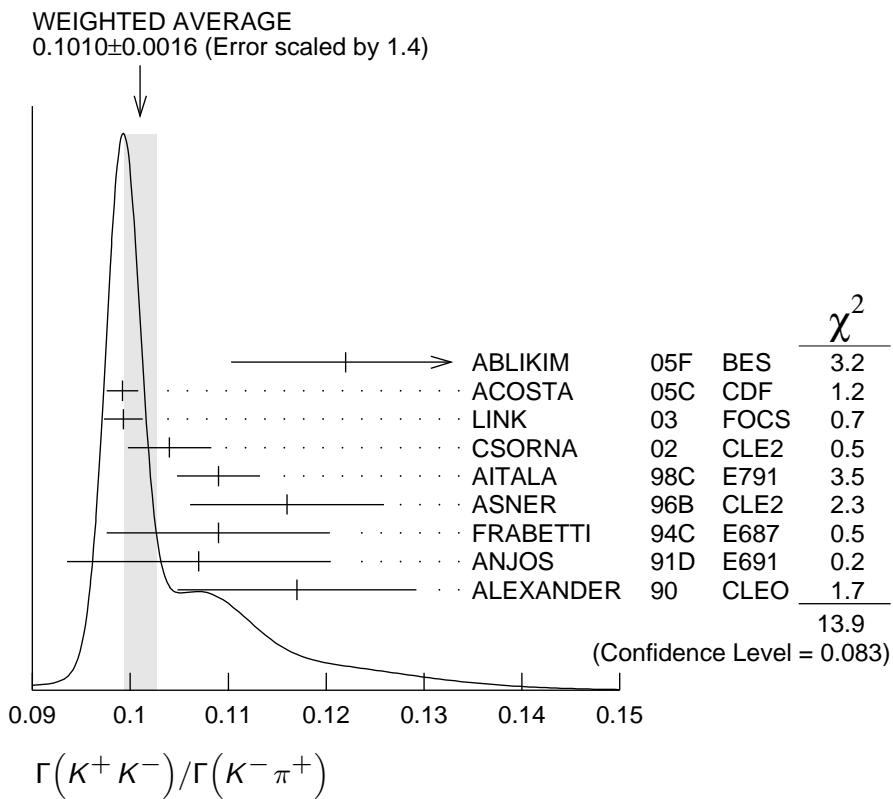
———— Hadronic modes with a  $K\bar{K}$  pair ———

$\Gamma(K^+ K^-)/\Gamma(K^- \pi^+)$

$\Gamma_{151}/\Gamma_{32}$

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.1010±0.0016 OUR AVERAGE</b>		Error includes scale factor of 1.4. See the ideogram below.		

0.122 $\pm 0.011 \pm 0.004$	242 $\pm 20$	ABLIKIM	05F BES	$e^+ e^- \approx \psi(3770)$
0.0992 $\pm 0.0011 \pm 0.0012$	16k $\pm 200$	ACOSTA	05C CDF	$p\bar{p}, \sqrt{s}=1.96$ TeV
0.0993 $\pm 0.0014 \pm 0.0014$	11k	LINK	03 FOCS	$\gamma$ nucleus, $\bar{E}_\gamma \approx 180$ GeV
0.1040 $\pm 0.0033 \pm 0.0027$	1900	CSORNA	02 CLE2	$e^+ e^- \approx \gamma(4S)$
0.109 $\pm 0.003 \pm 0.003$	3317	AITALA	98C E791	$\pi^-$ nucleus, 500 GeV
0.116 $\pm 0.007 \pm 0.007$	1102	ASNER	96B CLE2	$e^+ e^- \approx \gamma(4S)$
0.109 $\pm 0.007 \pm 0.009$	581	FRAZETTI	94C E687	$\gamma$ Be $\bar{E}_\gamma = 220$ GeV
0.107 $\pm 0.010 \pm 0.009$	193	ANJOS	91D E691	Photoproduction
0.117 $\pm 0.010 \pm 0.007$	249	ALEXANDER	90 CLEO	$e^+ e^-$ 10.5–11 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.107 $\pm 0.029 \pm 0.015$	103	ADAMOVICH	92 OMEG	$\pi^-$ 340 GeV
0.138 $\pm 0.027 \pm 0.010$	155	FRAZETTI	92 E687	$\gamma$ Be
0.16 $\pm 0.05$	34	ALVAREZ	91B NA14	Photoproduction
0.10 $\pm 0.02 \pm 0.01$	131	ALBRECHT	90C ARG	$e^+ e^- \approx 10$ GeV
0.122 $\pm 0.018 \pm 0.012$	118	BALTRUSAIT	..85E MRK3	$e^+ e^-$ 3.77 GeV
0.113 $\pm 0.030$		ABRAMS	79D MRK2	$e^+ e^-$ 3.77 GeV



### $\Gamma(K^+ K^-)/\Gamma(\pi^+ \pi^-)$

### $\Gamma_{151}/\Gamma_{133}$

The unused results here are redundant with  $\Gamma(K^+ K^-)/\Gamma(K^- \pi^+)$  and  $\Gamma(\pi^+ \pi^-)/\Gamma(K^- \pi^+)$  measurements by the same experiments.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>• • • We do not use the following data for averages, fits, limits, etc. • • •</b>				
2.760 $\pm$ 0.040 $\pm$ 0.034	7334	ACOSTA	05C	CDF $p\bar{p}$ , $\sqrt{s}=1.96$ TeV
2.81 $\pm$ 0.10 $\pm$ 0.06		LINK	03	FOCS $\gamma$ nucleus, $\bar{E}_\gamma \approx 180$ GeV
2.96 $\pm$ 0.16 $\pm$ 0.15	710	CSORNA	02	CLE2 $e^+ e^- \approx \Upsilon(4S)$
2.75 $\pm$ 0.15 $\pm$ 0.16		AITALA	98C	$\pi^-$ nucleus, 500 GeV
2.53 $\pm$ 0.46 $\pm$ 0.19		FRAZETTI	94C	$\gamma$ Be $\bar{E}_\gamma=220$ GeV
2.23 $\pm$ 0.81 $\pm$ 0.46		ADAMOVICH	92	OMEG $\pi^-$ 340 GeV
1.95 $\pm$ 0.34 $\pm$ 0.22		ANJOS	91D	E691 Photoproduction
2.5 $\pm$ 0.7		ALBRECHT	90C	ARG $e^+ e^- \approx 10$ GeV
2.35 $\pm$ 0.37 $\pm$ 0.28		ALEXANDER	90	CLEO $e^+ e^-$ 10.5–11 GeV

### $\Gamma(2K_S^0)/\Gamma(K_S^0 \pi^+ \pi^-)$

### $\Gamma_{152}/\Gamma_{34}$

This is the same as  $\Gamma(K^0 \bar{K}^0) / \Gamma(\bar{K}^0 \pi^+ \pi^-)$  because  $D^0 \rightarrow K_S^0 K_L^0$  is forbidden by  $CP$  conservation.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.0126 <math>\pm</math> 0.0022 OUR AVERAGE</b>				
0.0144 $\pm$ 0.0032 $\pm$ 0.0016	79 $\pm$ 17	LINK	05A	FOCS $\gamma$ Be, $\bar{E}_\gamma \approx 180$ GeV
0.0101 $\pm$ 0.0022 $\pm$ 0.0016	26	ASNER	96B	CLE2 $e^+ e^- \approx \Upsilon(4S)$
0.039 $\pm$ 0.013 $\pm$ 0.013	20 $\pm$ 7	FRAZETTI	94J	E687 $\gamma$ Be $\bar{E}_\gamma=220$ GeV
0.021 $^{+0.011}_{-0.008}$ $\pm$ 0.002	5	ALEXANDER	90	CLEO $e^+ e^-$ 10.5–11 GeV

$\Gamma(K_S^0 K^- \pi^+)/\Gamma(K^- \pi^+)$

$\Gamma_{153}/\Gamma_{32}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.089±0.013 OUR FIT</b>	Error includes scale factor of 1.1.		
<b>0.08 ±0.03</b>	88 ANJOS	91 E691	$\gamma$ Be 80–240 GeV

88 The factor 100 at the top of column 2 of Table I of ANJOS 91 should be omitted.

$\Gamma(K_S^0 K^- \pi^+)/\Gamma(K_S^0 \pi^+ \pi^-)$

$\Gamma_{153}/\Gamma_{34}$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.117±0.017 OUR FIT</b>		Error includes scale factor of 1.1.		
<b>0.119±0.021 OUR AVERAGE</b>		Error includes scale factor of 1.3.		
0.108±0.019	61	AMMAR	91 CLEO	$e^+ e^- \approx 10.5$ GeV
0.16 ±0.03 ±0.02	39	ALBRECHT	90C ARG	$e^+ e^- \approx 10$ GeV

$\Gamma(\bar{K}^*(892)^0 K_S^0)/\Gamma(K_S^0 \pi^+ \pi^-)$

$\Gamma_{177}/\Gamma_{34}$

Unseen decay modes of the  $\bar{K}^*(892)^0$  are included.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.029	90	AMMAR	91 CLEO	$e^+ e^- \approx 10.5$ GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.03	90	ALBRECHT	90C ARG	$e^+ e^- \approx 10$ GeV

$\Gamma(K_S^0 K^+ \pi^-)/\Gamma(K^- \pi^+)$

$\Gamma_{155}/\Gamma_{32}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.068±0.013 OUR FIT</b>			
<b>0.05 ±0.025</b>	89 ANJOS	91 E691	$\gamma$ Be 80–240 GeV

89 The factor 100 at the top of column 2 of Table I of ANJOS 91 should be omitted.

$\Gamma(K_S^0 K^+ \pi^-)/\Gamma(K_S^0 \pi^+ \pi^-)$

$\Gamma_{155}/\Gamma_{34}$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.090±0.017 OUR FIT</b>				
<b>0.098±0.020</b>	55	AMMAR	91 CLEO	$e^+ e^- \approx 10.5$ GeV

$\Gamma(K^*(892)^0 K_S^0)/\Gamma(K_S^0 \pi^+ \pi^-)$

$\Gamma_{178}/\Gamma_{34}$

Unseen decay modes of the  $K^*(892)^0$  are included.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.015	90	AMMAR	91 CLEO	$e^+ e^- \approx 10.5$ GeV

$\Gamma(K^+ K^- \pi^0)/\Gamma(K^- \pi^+ \pi^0)$

$\Gamma_{157}/\Gamma_{46}$

VALUE (units $10^{-2}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
<b>2.37±0.03±0.04</b>	$11k \pm 122$	AUBERT,B	06X BABR	$e^+ e^- \approx \gamma(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.95±0.26	151	ASNER	96B CLE2	$e^+ e^- \approx \gamma(4S)$

$\Gamma(K^*(892)^+ K^-, K^*(892)^+ \rightarrow K^+ \pi^0)/\Gamma(K^+ K^- \pi^0)$

$\Gamma_{158}/\Gamma_{157}$

This is the “fit fraction” from the Dalitz-plot analysis with interference.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.461±0.031</b>	90 CAWLFIELD	06A CLEO	Dalitz fit, $627 \pm 30$ evts

90 The error on this CAWLFIELD 06A result is statistical only.

$\Gamma(K^*(892)^- K^+, K^*(892)^- \rightarrow K^- \pi^0)/\Gamma(K^+ K^- \pi^0)$   $\Gamma_{159}/\Gamma_{157}$

This is the “fit fraction” from the Dalitz-plot analysis with interference.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.123±0.022</b>	91 CAWLFIELD	06A CLEO	Dalitz fit, $627 \pm 30$ evts

91 The error on this CAWLFIELD 06A result is statistical only.

$\Gamma(\phi \pi^0, \phi \rightarrow K^+ K^-)/\Gamma(K^+ K^- \pi^0)$   $\Gamma_{160}/\Gamma_{157}$

This is the “fit fraction” from the Dalitz-plot analysis with interference.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.149±0.016</b>	92 CAWLFIELD	06A CLEO	Dalitz fit, $627 \pm 30$ evts

92 The error on this CAWLFIELD 06A result is statistical only.

$\Gamma(K^+ K^- \pi^0 \text{nonresonant})/\Gamma(K^+ K^- \pi^0)$   $\Gamma_{161}/\Gamma_{157}$

This is the “fit fraction” from the Dalitz-plot analysis with interference.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.360±0.037</b>	93 CAWLFIELD	06A CLEO	Dalitz fit, $627 \pm 30$ evts

93 The error is statistical only. CAWLFIELD 06A also fits the Dalitz plot replacing this flat nonresonant background with broad  $S$ -wave  $\kappa^\pm \rightarrow K^\pm \pi^0$  resonances. There is no significant improvement in the fit, and  $K^*\pm K^\mp$  and  $\phi \pi^0$  results are not much changed.

$\Gamma(K_S^0 K_S^0 \pi^0)/\Gamma_{\text{total}}$   $\Gamma_{162}/\Gamma$

VALUE	DOCUMENT ID	TECN	COMMENT
<0.00059	ASNER	96B CLE2	$e^+ e^- \approx \gamma(4S)$

$\Gamma(\phi \pi^0)/\Gamma(K^+ K^-)$   $\Gamma_{179}/\Gamma_{151}$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.194±0.006±0.009</b>	1254	TAJIMA	04 BELL	$e^+ e^- \text{ at } \gamma(4S)$

$\Gamma(\phi \eta)/\Gamma(K^+ K^-)$   $\Gamma_{180}/\Gamma_{151}$

VALUE (units $10^{-2}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
<b>3.59±1.14±0.18</b>	31	TAJIMA	04 BELL	$e^+ e^- \text{ at } \gamma(4S)$

$\Gamma(\phi \omega)/\Gamma_{\text{total}}$   $\Gamma_{181}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0021	90	ALBRECHT	94I ARG	$e^+ e^- \approx 10 \text{ GeV}$

$\Gamma(K^+ K^- \pi^+ \pi^-)/\Gamma(K^- \pi^+ \pi^+ \pi^-)$   $\Gamma_{163}/\Gamma_{58}$

VALUE (units $10^{-2}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
<b>3.00±0.13 OUR AVERAGE</b>				

2.95±0.11±0.08	2669 ± 101	94 LINK	05G FOCS	$\gamma\text{Be}, \bar{E}_\gamma \approx 180 \text{ GeV}$
3.13±0.37±0.36	136 ± 15	AITALA	98D E791	$\pi^- \text{ nucleus}, 500 \text{ GeV}$
3.5 ± 0.4 ± 0.2	244 ± 26	FRAZETTI	95C E687	$\gamma\text{Be}, \bar{E}_\gamma \approx 200 \text{ GeV}$

• • • We do not use the following data for averages, fits, limits, etc. • • •

4.4 ± 1.8 ± 0.5	19 ± 8	ABLIKIM	05F BES	$e^+ e^- \approx \psi(3770)$
4.1 ± 0.7 ± 0.5	114 ± 20	ALBRECHT	94I ARG	$e^+ e^- \approx 10 \text{ GeV}$
3.14 ± 1.0	89 ± 29	AMMAR	91 CLEO	$e^+ e^- \approx 10.5 \text{ GeV}$
2.8 ± 0.8		ANJOS	91 E691	$\gamma\text{Be} 80\text{--}240 \text{ GeV}$

94 LINK 05G uses a smaller, cleaner subset of  $1279 \pm 48$  events for the amplitude analysis that gives the results in the next data blocks.

$$\Gamma(\phi\pi^+\pi^- \text{3-body}, \phi \rightarrow K^+K^-)/\Gamma(K^+K^-\pi^+\pi^-) \quad \Gamma_{164}/\Gamma_{163}$$

This is the fraction from a coherent amplitude analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.01 ± 0.01</b>	LINK	05G FOCS	$1279 \pm 48$ $K^+K^-\pi^+\pi^-$ evts.

$$\Gamma(\phi\rho^0, \phi \rightarrow K^+K^-)/\Gamma(K^+K^-\pi^+\pi^-) \quad \Gamma_{165}/\Gamma_{163}$$

This is the fraction from a coherent amplitude analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.29 ± 0.02 ± 0.01</b>	LINK	05G FOCS	$1279 \pm 48$ $K^+K^-\pi^+\pi^-$ evts.

$$\Gamma(K^+K^-\rho^0 \text{3-body})/\Gamma(K^+K^-\pi^+\pi^-) \quad \Gamma_{166}/\Gamma_{163}$$

This is the fraction from a coherent amplitude analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.02 ± 0.02 ± 0.02</b>	LINK	05G FOCS	$1279 \pm 48$ $K^+K^-\pi^+\pi^-$ evts.

$$\Gamma(f_0(980)\pi^+\pi^-, f_0 \rightarrow K^+K^-)/\Gamma(K^+K^-\pi^+\pi^-) \quad \Gamma_{167}/\Gamma_{163}$$

This is the fraction from a coherent amplitude analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.15 ± 0.03 ± 0.02</b>	LINK	05G FOCS	$1279 \pm 48$ $K^+K^-\pi^+\pi^-$ evts.

$$\Gamma(K^*(892)^0 K^\mp \pi^\pm \text{3-body}, K^{*0} \rightarrow K^\pm \pi^\mp)/\Gamma(K^+K^-\pi^+\pi^-) \quad \Gamma_{168}/\Gamma_{163}$$

This is the fraction from a coherent amplitude analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.11 ± 0.02 ± 0.01</b>	LINK	05G FOCS	$1279 \pm 48$ $K^+K^-\pi^+\pi^-$ evts.

$$\Gamma(K^*(892)^0 \bar{K}^*(892)^0, K^{*0} \rightarrow K^\pm \pi^\mp)/\Gamma(K^+K^-\pi^+\pi^-) \quad \Gamma_{169}/\Gamma_{163}$$

This is the fraction from a coherent amplitude analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.03 ± 0.02 ± 0.01</b>	LINK	05G FOCS	$1279 \pm 48$ $K^+K^-\pi^+\pi^-$ evts.

$$\Gamma(K_1(1270)^\pm K^\mp, K_1(1270)^\pm \rightarrow K^\pm \pi^+\pi^-)/\Gamma(K^+K^-\pi^+\pi^-) \quad \Gamma_{170}/\Gamma_{163}$$

This is the fraction from a coherent amplitude analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.33 ± 0.06 ± 0.04</b>	95 LINK	05G FOCS	$1279 \pm 48$ $K^+K^-\pi^+\pi^-$ evts.

<sup>95</sup> This LINK 05G value includes  $K_1(1270)^\pm \rightarrow \rho^0 K^\pm$ ,  $\rightarrow K_0^*(1430)^0 \pi^\pm$ , and  $K^*(892)^0 \pi^\pm$ .

$$\Gamma(K_1(1400)^\pm K^\mp, K_1(1400)^\pm \rightarrow K^\pm \pi^+\pi^-)/\Gamma(K^+K^-\pi^+\pi^-) \quad \Gamma_{171}/\Gamma_{163}$$

This is the fraction from a coherent amplitude analysis.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.22 ± 0.03 ± 0.04</b>	LINK	05G FOCS	$1279 \pm 48$ $K^+K^-\pi^+\pi^-$ evts.

$$\Gamma(K_S^0 K_S^0 \pi^+\pi^-)/\Gamma(K_S^0 \pi^+\pi^-) \quad \Gamma_{174}/\Gamma_{34}$$

VALUE (units $10^{-2}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
<b>4.3 ± 0.8 OUR AVERAGE</b>				
4.16 ± 0.70 ± 0.42	113 ± 21	LINK	05A FOCS	$\gamma$ Be, $\bar{E}_\gamma \approx 180$ GeV
6.2 ± 2.0 ± 1.6	25	ALBRECHT	94I ARG	$e^+e^- \approx 10$ GeV

$\Gamma(K_S^0 K^- \pi^+ \pi^+ \pi^-)/\Gamma(K_S^0 2\pi^+ 2\pi^-)$				$\Gamma_{175}/\Gamma_{82}$
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<0.054	90	LINK	04D FOCS	$\gamma$ A, $E_\gamma \approx 180$ GeV

$\Gamma(K^+ K^- \pi^+ \pi^- \pi^0)/\Gamma_{\text{total}}$				$\Gamma_{176}/\Gamma$
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
<b>0.0031 ± 0.0020</b>	96 BARLAG	92C ACCM	$\pi^-$ Cu	230 GeV

96 BARLAG 92C computes the branching fraction using topological normalization.

### ———— Radiative modes ————

$\Gamma(\rho^0 \gamma)/\Gamma_{\text{total}}$				$\Gamma_{182}/\Gamma$
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	
<2.4 × 10 <sup>-4</sup>	90	ASNER	98	CLE2

$\Gamma(\omega \gamma)/\Gamma_{\text{total}}$				$\Gamma_{183}/\Gamma$
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	
<2.4 × 10 <sup>-4</sup>	90	ASNER	98	CLE2

$\Gamma(\phi \gamma)/\Gamma_{\text{total}}$				$\Gamma_{184}/\Gamma$
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<1.9 × 10 <sup>-4</sup>	90	ASNER	98	CLE2

$\Gamma(\phi \gamma)/\Gamma(K^+ K^-)$				$\Gamma_{184}/\Gamma_{151}$
<u>VALUE</u> (units 10 <sup>-3</sup> )	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>6.31<sup>+1.70<sub>-1.48</sub></sup><sub>+0.30<sub>-0.36</sub></sub></b>	28	TAJIMA	04 BELL	$e^+ e^-$ at $\gamma(4S)$

$\Gamma(\bar{K}^*(892)^0 \gamma)/\Gamma_{\text{total}}$				$\Gamma_{185}/\Gamma$
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	
<7.6 × 10 <sup>-4</sup>	90	ASNER	98	CLE2

### ———— Doubly Cabibbo-suppressed / Mixing modes ————

$\Gamma(K^+ \ell^- \bar{\nu}_\ell (\text{via } \bar{D}^0))/\Gamma(K^- \ell^+ \nu_\ell)$				$\Gamma_{186}/\Gamma_{17}$
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<0.005	90	97 AITALA	96C E791	$\pi^-$ nucleus, 500 GeV

97 AITALA 96C uses  $D^{*+} \rightarrow D^0 \pi^+$  (and charge conjugate) decays to identify the charm at production and  $D^0 \rightarrow K^- \ell^+ \nu_\ell$  (and charge conjugate) decays to identify the charm at decay.

$$\frac{\Gamma(K^+ \text{ or } K^*(892)^+ e^- \bar{\nu}_e (\text{via } \bar{D}^0)) / [\Gamma(K^- e^+ \nu_e) + \Gamma(K^*(892)^- e^+ \nu_e)]}{\Gamma_{187}/(\Gamma_{18} + \Gamma_{20})}$$

This is a limit on  $R_M$  without the complications of possible doubly-Cabibbo-suppressed decays that occur when using hadronic modes. For the limits on  $|m_1 - m_2|$  and  $(\Gamma_1 - \Gamma_2)/\Gamma$  that come from the best mixing limit, see near the beginning of these  $D^0$  Listings.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.001	90	98 BITENC	05 BELL	$e^+ e^- \approx 10.6 \text{ GeV}$
<b>• • • We do not use the following data for averages, fits, limits, etc. • • •</b>				
<0.0078	90	98 CAWLFIELD	05 CLEO	$e^+ e^- \approx 10.6 \text{ GeV}$
<0.0042	90	98 AUBERT,B	04Q BABR	$e^+ e^- \approx \Upsilon(4S)$

98 AUBERT,B 04Q, CAWLFIELD 05, and BITENC 05 use  $D^{*+} \rightarrow D^0 \pi^+$  (and charge conjugate) decays to identify the charm at production and the charge of the  $e$  to identify the charm at decay. These limits do not allow  $CP$  violation.

$$\Gamma(K^+ \pi^-)/\Gamma(K^- \pi^+)$$

$$\Gamma_{188}/\Gamma_{32}$$

This is  $R_D$  in the note on “ $D^0$ - $\bar{D}^0$  Mixing,” near the start of the  $D^0$  Listings. The experiments here use the charge of the pion in  $D^*(2010)^\pm \rightarrow (D^0 \text{ or } \bar{D}^0) \pi^\pm$  decay to tell whether a  $D^0$  or a  $\bar{D}^0$  was born. The  $D^0 \rightarrow K^+ \pi^-$  decay can occur directly by doubly Cabibbo-suppressed (DCS) decay, or indirectly by  $D^0 \rightarrow \bar{D}^0$  mixing followed by  $\bar{D}^0 \rightarrow K^+ \pi^-$  decay. Some of the experiments can use the decay-time information to disentangle the two mechanisms. Here, we list the experimental branching ratio, which if there is no mixing is the DCS ratio. See the next data block for limits on the mixing ratio  $R_M$ , see the section on  $CP$ -violating asymmetries near the end of this  $D^0$  Listing for values of  $A_D$ , and see the note on “ $D^0$ - $\bar{D}^0$  Mixing” for limits on  $x'$  and  $y'$ .

Some early limits have been omitted from this Listing; see our 1998 edition (EPJ **C3** 1).

VALUE (units $10^{-3}$ )	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
<b>3.80 ± 0.08 OUR AVERAGE</b>					
4.05 ± 0.21 ± 0.11	2.0 ± 0.1k	99 ABULENCIA	06X CDF	$p\bar{p}, \sqrt{s} = 1.96 \text{ TeV}$	
3.77 ± 0.08 ± 0.05	4024 ± 88	100 ZHANG	06 BELL	$e^+ e^-$	
4.29 <sup>+0.63</sup> <sub>-0.61</sub> ± 0.27	234	101 LINK	05H FOCS	$\gamma$ nucleus	
3.59 ± 0.20 ± 0.27		102 AUBERT	03Z BABR	$e^+ e^-, 10.6 \text{ GeV}$	
3.32 <sup>+0.63</sup> <sub>-0.65</sub> ± 0.40	45	103 GODANG	00 CLE2	$e^+ e^-$	
6.8 <sup>+3.4</sup> <sub>-3.3</sub> ± 0.7	34	104 AITALA	98 E791	$\pi^-$ nucl., 500 GeV	
<b>• • • We do not use the following data for averages, fits, limits, etc. • • •</b>					
3.81 ± 0.17 <sup>+0.08</sup> <sub>-0.16</sub>	845 ± 40	105 LI	05A BELL	See ZHANG 06	
4.04 ± 0.85 ± 0.25	149	106 LINK	01 FOCS	$\gamma$ nucleus	
18.4 ± 5.9 ± 3.4	19	107 BARATE	98W ALEP	$e^+ e^-$ at $Z^0$	
7.7 ± 2.5 ± 2.5	19	108 CINABRO	94 CLE2	$e^+ e^- \approx \Upsilon(4S)$	
< 11	90	108 AMMAR	91 CLEO	$e^+ e^- \approx 10.5 \text{ GeV}$	
< 15	90	109 ANJOS	88C E691	Photoproduction	
< 14	90	108 ALBRECHT	87K ARG	$e^+ e^- 10 \text{ GeV}$	

- 99 This ABULENCIA 06X result assumes no mixing.
- 100 This ZHANG 06 result assumes no mixing. If mixing but no  $CP$  violation is allowed,  $R_D = (3.64 \pm 0.17) \times 10^{-3}$ .
- 101 This LINK 05H result assumes no mixing or  $CP$  violation. Allowing  $CP$  violation but no mixing,  $R_D = (4.29 \pm 0.63 \pm 0.28) \times 10^{-3}$  — negligibly different. Allowing mixing but no  $CP$  violation,  $R_D = (3.81^{+1.67}_{-1.63} \pm 0.92) \times 10^{-3}$ . Allowing mixing and  $CP$  violation,  $R_D = (5.17^{+1.47}_{-1.58} \pm 0.76) \times 10^{-3}$ .
- 102 This AUBERT 03Z result is for no mixing or  $CP$  violation. If  $CP$  violation but no mixing is allowed,  $R_D = 0.00357 \pm 0.00022 \pm 0.00027$ . If only mixing is allowed, the 95% confidence-level interval is  $(2.4 < R_D < 4.9) \times 10^{-3}$ . If both mixing and  $CP$  violation are allowed, this interval becomes  $(2.3 < R_D < 5.2) \times 10^{-3}$ .
- 103 This GODANG 00 result assumes no  $D^0$ - $\bar{D}^0$  mixing ( $R_M = 0$  in the note on “ $D^0$ - $\bar{D}^0$  Mixing” near the start of the  $D^0$  Listings) but allows  $CP$  violation. The DCS ratio becomes  $0.0048 \pm 0.0012 \pm 0.0004$  when mixing is allowed.
- 104 This AITALA 98 result assumes no  $CP$  violation or mixing ( $R_M = 0$  in the note on “ $D^0$ - $\bar{D}^0$  Mixing” near the start of the  $D^0$  Listings). The DCS ratio becomes  $0.0090^{+0.0120}_{-0.0109} \pm 0.0044$  when mixing is allowed.
- 105 This LI 05A result assumes no mixing or  $CP$  violation. If mixing but no  $CP$  violation is allowed,  $R_D = (2.87 \pm 0.37) \times 10^{-3}$ .
- 106 This LINK 01 result assumes no mixing or  $CP$  violation; see Fig. 4 of the paper for the DCS value as a function of the (unknown) mixing parameters  $x'$  and  $y'$ . See also the note on “ $D^0$ - $\bar{D}^0$  Mixing” near the start of the  $D^0$  Listings for results on  $x'$  and  $y'$  from FOCUS and other experiments.
- 107 BARATE 98W gets  $0.0177^{+0.0060}_{-0.0056} \pm 0.0031$  for the DCS ratio when mixing is allowed, assuming no interference between the DCS and mixing amplitudes ( $y' = 0$  in the note on “ $D^0$ - $\bar{D}^0$  Mixing” near the start of the  $D^0$  Listings).
- 108 CINABRO 94, AMMAR 91, and ALBRECHT 87K cannot distinguish between doubly Cabibbo-suppressed decay and  $D^0$ - $\bar{D}^0$  mixing.
- 109 ANJOS 88C allows mixing but assumes no interference between the DCS and mixing amplitudes ( $y' = 0$  in the note on “ $D^0$ - $\bar{D}^0$  Mixing” near the start of the  $D^0$  Listings). When interference is allowed, the limit degrades to 0.049.

### $\Gamma(K^+\pi^- (\text{via } \bar{D}^0))/\Gamma(K^-\pi^+)$

### $\Gamma_{189}/\Gamma_{32}$

This is  $R_M$  in the note on “ $D^0$ - $\bar{D}^0$  Mixing” near the start of the  $D^0$  Listings. The experiments here (1) use the charge of the pion in  $D^*(2010)^{\pm} \rightarrow (D^0 \text{ or } \bar{D}^0) \pi^{\pm}$  decay to tell whether a  $D^0$  or a  $\bar{D}^0$  was born; and (2) use the decay-time distribution to disentangle doubly Cabibbo-suppressed decay and mixing. For the limits on  $|m_1 - m_2|$  and  $(\Gamma_1 - \Gamma_2)/\Gamma$  that come from the best mixing limit, see near the beginning of these  $D^0$  Listings.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.00040</b>	95	110	ZHANG	06	BELL $e^+e^-$
<b>• • •</b> We do not use the following data for averages, fits, limits, etc. <b>• • •</b>					
<0.00046	95	111	LI	05A	BELL See ZHANG 06
<0.0063	95	112	LINK	05H	FOCS $\gamma$ nucleus
<0.0013	95	113	AUBERT	03Z	BABR $e^+e^-$ , 10.6 GeV
<0.00041	95	114	GODANG	00	CLE2 $e^+e^-$
<0.0092	95	115	BARATE	98W	ALEP $e^+e^-$ at $Z^0$
<0.005	90	1 ± 4	ANJOS	88C	E691 Photoproduction

- 110 This ZHANG 06 result allows  $CP$  violation, but the result does not change if  $CP$  violation is not allowed.  
 111 This LI 05A result allows  $CP$  violation. The limit becomes  $< 0.00042$  (95% CL) if  $CP$  violation is not allowed.  
 112 LINK 05H obtains the same result whether or not  $CP$  violation is allowed.  
 113 This AUBERT 03Z result allows  $CP$  violation and assumes that the strong phase between  $D^0 \rightarrow K^+ \pi^-$  and  $\bar{D}^0 \rightarrow K^+ \pi^-$  is small, and limits only  $D^0 \rightarrow \bar{D}^0$  transitions via off-shell intermediate states. The limit on transitions via on-shell intermediate states is 0.0016.  
 114 This GODANG 00 result allows  $CP$  violation and assumes that the strong phase between  $D^0 \rightarrow K^+ \pi^-$  and  $\bar{D}^0 \rightarrow K^+ \pi^-$  is small, and limits only  $D^0 \rightarrow \bar{D}^0$  transitions via off-shell intermediate states. The limit on transitions via on-shell intermediate states is 0.0017.  
 115 This BARATE 98W result assumes no interference between the DCS and mixing amplitudes ( $y' = 0$  in the note on “ $D^0$ - $\bar{D}^0$  Mixing” near the start of the  $D^0$  Listings). When interference is allowed, the limit degrades to 0.036 (95%CL).  
 116 This ANJOS 88C result assumes no interference between the DCS and mixing amplitudes ( $y' = 0$  in the note on “ $D^0$ - $\bar{D}^0$  Mixing” near the start of the  $D^0$  Listings). When interference is allowed, the limit degrades to 0.019.

### $\Gamma(K_S^0 \pi^+ \pi^- (\text{in } D^0 \rightarrow \bar{D}^0)) / \Gamma(K_S^0 \pi^+ \pi^-)$

$\Gamma_{190}/\Gamma_{34}$

This is  $R_M$  in the note on “ $D^0$ - $\bar{D}^0$  Mixing” near the start of the  $D^0$  Listings. The experiments here (1) use the charge of the pion in  $D^*(2010)^{\pm} \rightarrow (D^0 \text{ or } \bar{D}^0) \pi^{\pm}$  decay to tell whether a  $D^0$  or a  $\bar{D}^0$  was born; and (2) use the decay-time distribution to disentangle doubly Cabibbo-suppressed decay and mixing. For the limits on  $|m_1 - m_2|$  and  $(\Gamma_1 - \Gamma_2)/\Gamma$  that come from the best mixing limit, see near the beginning of these  $D^0$  Listings.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0063	95	117 ASNER	05 CLEO	$e^+ e^- \approx 10 \text{ GeV}$

- 117 This ASNER 05 limit allows  $CP$  violation. If  $CP$  violation is not allowed, the limit is 0.0042 at 95% CL.

### $\Gamma(K^+ \pi^- \pi^0) / \Gamma(K^- \pi^+ \pi^0)$

$\Gamma_{192}/\Gamma_{46}$

The experiments here use the charge of the pion in  $D^*(2010)^{\pm} \rightarrow (D^0 \text{ or } \bar{D}^0) \pi^{\pm}$  decay to tell whether a  $D^0$  or a  $\bar{D}^0$  was born. The  $D^0 \rightarrow K^+ \pi^- \pi^0$  decay can occur directly by doubly Cabibbo-suppressed (DCS) decay, or indirectly by  $D^0 \rightarrow \bar{D}^0$  mixing followed by  $\bar{D}^0 \rightarrow K^+ \pi^- \pi^0$  decay.

VALUE (units $10^{-3}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
<b>2.20 ± 0.10 OUR AVERAGE</b>				
2.14 ± 0.08 ± 0.08	763 ± 51	118 AUBERT,B	06N BABR	$e^+ e^- \approx \Upsilon(4S)$
2.29 ± 0.15 ± 0.09	1978 ± 104	TIAN	05 BELL	$e^+ e^- \approx \Upsilon(4S)$
4.3 ± 1.1 ± 0.7	38	BRANDENB...	01 CLE2	$e^+ e^- \approx \Upsilon(4S)$

- 118 This AUBERT,B 06N result assumes no mixing.

$\Gamma(K^+\pi^-\pi^0(\text{via } \bar{D}^0))/\Gamma(K^-\pi^+\pi^0)$  $\Gamma_{193}/\Gamma_{46}$ 

This is  $R_M$  in the note on “ $D^0$ - $\bar{D}^0$  Mixing” near the start of the  $D^0$  Listings. The experiments here (1) use the charge of the pion in  $D^*(2010)^{\pm} \rightarrow (D^0 \text{ or } \bar{D}^0) \pi^{\pm}$  decay to tell whether a  $D^0$  or a  $\bar{D}^0$  was born; and (2) use the decay-time distribution to disentangle doubly Cabibbo-suppressed decay and mixing. For the limits on  $|m_1 - m_2|$  and  $(\Gamma_1 - \Gamma_2)/\Gamma$  that come from the best mixing limit, see near the beginning of these  $D^0$  Listings.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<5.4 \times 10^{-4}$	95	119 AUBERT,B	06N BABR	$e^+e^- \approx \gamma(4S)$

119 This AUBERT,B 06N limit assumes no  $CP$  violation. The measured value corresponding to the limit is  $(2.3^{+1.8}_{-1.4} \pm 0.4) \times 10^{-4}$ . If  $CP$  violation is allowed, this becomes  $(1.0^{+2.2}_{-0.7} \pm 0.3) \times 10^{-4}$ .

 $\Gamma(K^+\pi^-\pi^+\pi^-)/\Gamma(K^-\pi^+\pi^+\pi^-)$  $\Gamma_{194}/\Gamma_{58}$ 

The experiments here use the charge of the pion in  $D^*(2010)^{\pm} \rightarrow (D^0 \text{ or } \bar{D}^0) \pi^{\pm}$  decay to tell whether a  $D^0$  or a  $\bar{D}^0$  was born. The  $D^0 \rightarrow K^+\pi^-\pi^+\pi^-$  decay can occur directly by doubly Cabibbo-suppressed (DCS) decay, or indirectly by  $D^0 \rightarrow \bar{D}^0$  mixing followed by  $\bar{D}^0 \rightarrow K^+\pi^-\pi^+\pi^-$  decay. Some of the experiments can use the decay-time information to disentangle the two mechanisms. Here, we list the experimental branching ratio, which if there is no mixing is the DCS ratio; in the next data block we give the limits on the mixing ratio.

Some early limits have been omitted from this Listing; see our 1998 edition (EPJ **C3** 1).

VALUE (units $10^{-3}$ )	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
<b><math>3.23^{+0.25}_{-0.22}</math> OUR AVERAGE</b>					
$3.20 \pm 0.18^{+0.18}_{-0.13}$	$1721 \pm 75$	120 TIAN	05 BELL	$e^+e^- \approx \gamma(4S)$	
$4.4^{+1.3}_{-1.2} \pm 0.6$	54	120 DYTMAN	01 CLE2	$e^+e^- \approx \gamma(4S)$	
$2.5^{+3.6}_{-3.4} \pm 0.3$		121 AITALA	98 E791	$\pi^-$ nucl., 500 GeV	

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<18$	90	120 AMMAR	91 CLEO	$e^+e^- \approx 10.5$ GeV
$<18$	90	$5 \pm 12$	122 ANJOS	88C E691 Photoproduction

120 AMMAR 91 cannot and DYTMAN 01 and TIAN 05 do not distinguish between doubly Cabibbo-suppressed decay and  $D^0$ - $\bar{D}^0$  mixing.

121 This AITALA 98 result assumes no  $D^0$ - $\bar{D}^0$  mixing ( $R_M$  in the note on “ $D^0$ - $\bar{D}^0$  Mixing”). It becomes  $-0.0020^{+0.0117}_{-0.0106} \pm 0.0035$  when mixing is allowed and decay-time information is used to distinguish doubly Cabibbo-suppressed decays from mixing.

122 ANJOS 88C uses decay-time information to distinguish doubly Cabibbo-suppressed (DCS) decays from  $D^0$ - $\bar{D}^0$  mixing. However, the result assumes no interference between the DCS and mixing amplitudes ( $y' = 0$  in the note on “ $D^0$ - $\bar{D}^0$  Mixing” near the start of the  $D^0$  Listings). When interference is allowed, the limit degrades to 0.033.

$\Gamma(K^+\pi^-\pi^+\pi^- \text{ (via } \bar{D}^0\text{)})/\Gamma(K^-\pi^+\pi^+\pi^-)$   $\Gamma_{195}/\Gamma_{58}$ 

This is a  $D^0$ - $\bar{D}^0$  mixing limit. The experiments here (1) use the charge of the pion in  $D^*(2010)^\pm \rightarrow (D^0 \text{ or } \bar{D}^0) \pi^\pm$  decay to tell whether a  $D^0$  or a  $\bar{D}^0$  was born; and (2) use the decay-time distribution to disentangle doubly Cabibbo-suppressed decay and mixing. For the limits on  $|m_{D_1^0} - m_{D_2^0}|$  and  $(\Gamma_{D_1^0} - \Gamma_{D_2^0})/\Gamma_{D^0}$  that come from the best mixing limit, see near the beginning of these  $D^0$  Listings.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
<0.005	90	$0 \pm 4$	123 ANJOS	88C E691	Photoproduction

123 ANJOS 88C uses decay-time information to distinguish doubly Cabibbo-suppressed (DCS) decays from  $D^0$ - $\bar{D}^0$  mixing. However, the result assumes no interference between the DCS and mixing amplitudes ( $y' = 0$  in the note on “ $D^0$ - $\bar{D}^0$  Mixing” near the start of the  $D^0$  Listings). When interference is allowed, the limit degrades to 0.007.

 $\Gamma(K^+\pi^- \text{ or } K^+\pi^-\pi^+\pi^- \text{ (via } \bar{D}^0\text{)})/\Gamma(K^-\pi^+ \text{ or } K^-\pi^+\pi^+\pi^-)$   $\Gamma_{196}/\Gamma_0$ 

This is a  $D^0$ - $\bar{D}^0$  mixing limit. For the limits on  $|m_{D_1^0} - m_{D_2^0}|$  and  $(\Gamma_{D_1^0} - \Gamma_{D_2^0})/\Gamma_{D^0}$  that come from the best mixing limit, see near the beginning of these  $D^0$  Listings.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.0085	90	124 AITALA	98 E791	$\pi^-$ nucleus, 500 GeV
<0.0037	90	125 ANJOS	88C E691	Photoproduction

124 AITALA 98 uses decay-time information to distinguish doubly Cabibbo-suppressed decays from  $D^0$ - $\bar{D}^0$  mixing. The fit allows interference between the two amplitudes, and also allows  $CP$  violation in this term. The central value obtained is  $0.0039^{+0.0036}_{-0.0032} \pm 0.0016$ . When interference is disallowed, the result becomes  $0.0021 \pm 0.0009 \pm 0.0002$ .

125 This combines results of ANJOS 88C on  $K^+\pi^-$  and  $K^+\pi^-\pi^+\pi^-$  (via  $\bar{D}^0$ ) reported in the data block above (see footnotes there). It assumes no interference.

 $\Gamma(\mu^- \text{ anything (via } \bar{D}^0\text{)})/\Gamma(\mu^+ \text{ anything})$   $\Gamma_{197}/\Gamma_6$ 

This is a  $D^0$ - $\bar{D}^0$  mixing limit. See the somewhat better limits above.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0056	90	LOUIS	86 SPEC	$\pi^-$ W 225 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.012	90	BENVENUTI	85 CNTR	$\mu$ C, 200 GeV
<0.044	90	BODEK	82 SPEC	$\pi^-$ , $p$ Fe $\rightarrow$ $D^0$

**Rare or forbidden modes** $\Gamma(\gamma\gamma)/\Gamma(\pi^0\pi^0)$   $\Gamma_{198}/\Gamma_{134}$ 

$D^0 \rightarrow \gamma\gamma$  is a flavor-changing neutral-current decay, forbidden in the Standard Model at the tree level.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.033	90	COAN	03 CLE2	$e^+e^- \approx \gamma(4S)$

$\Gamma(e^+e^-)/\Gamma_{\text{total}}$  $\Gamma_{199}/\Gamma$ 

A test for the  $\Delta C = 1$  weak neutral current. Allowed by first-order weak interaction combined with electromagnetic interaction.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<1.2 \times 10^{-6}$	90	3	AUBERT,B	04Y	BABR $e^+e^- \approx \gamma(4S)$
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$					
$<8.19 \times 10^{-6}$	90		PRIPSTEIN	00	E789 $p$ nucleus, 800 GeV
$<6.2 \times 10^{-6}$	90		AITALA	99G	E791 $\pi^- N$ 500 GeV
$<1.3 \times 10^{-5}$	90	0	FREYBERGER	96	CLE2 $e^+e^- \approx \gamma(4S)$
$<1.3 \times 10^{-4}$	90		ADLER	88	MRK3 $e^+e^-$ 3.77 GeV
$<1.7 \times 10^{-4}$	90	7	ALBRECHT	88G	ARG $e^+e^-$ 10 GeV
$<2.2 \times 10^{-4}$	90	8	HAAS	88	CLEO $e^+e^-$ 10 GeV

 $\Gamma(\mu^+\mu^-)/\Gamma_{\text{total}}$  $\Gamma_{200}/\Gamma$ 

A test for the  $\Delta C = 1$  weak neutral current. Allowed by first-order weak interaction combined with electromagnetic interaction.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<1.3 \times 10^{-6}$	90	1	AUBERT,B	04Y	BABR $e^+e^- \approx \gamma(4S)$
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$					
$<2.0 \times 10^{-6}$	90		ABT	04	HERB $pA$ , 920 GeV
$<2.5 \times 10^{-6}$	90		ACOSTA	03F	CDF $p\bar{p}$ , $\sqrt{s} = 1.96$ TeV
$<1.56 \times 10^{-5}$	90		PRIPSTEIN	00	E789 $p$ nucleus, 800 GeV
$<5.2 \times 10^{-6}$	90		AITALA	99G	E791 $\pi^- N$ 500 GeV
$<4.1 \times 10^{-6}$	90		ADAMOVICH	97	BEAT $\pi^- Cu$ , W 350 GeV
$<4.2 \times 10^{-6}$	90		ALEXOPOU...	96	E771 $p Si$ , 800 GeV
$<3.4 \times 10^{-5}$	90	1	FREYBERGER	96	CLE2 $e^+e^- \approx \gamma(4S)$
$<7.6 \times 10^{-6}$	90	0	ADAMOVICH	95	BEAT See ADAMOVICH 97
$<4.4 \times 10^{-5}$	90	0	KODAMA	95	E653 $\pi^-$ emulsion 600 GeV
$<3.1 \times 10^{-5}$	90	126	MISHRA	94	E789 $-4.1 \pm 4.8$ events
$<7.0 \times 10^{-5}$	90		ALBRECHT	88G	ARG $e^+e^-$ 10 GeV
$<1.1 \times 10^{-5}$	90		LOUIS	86	SPEC $\pi^- W$ 225 GeV
$<3.4 \times 10^{-4}$	90		AUBERT	85	EMC Deep inelast. $\mu^- N$

<sup>126</sup> Here MISHRA 94 uses “the statistical approach advocated by the PDG.” For an alternate approach, giving a limit of  $9 \times 10^{-6}$  at 90% confidence level, see the paper.

 $\Gamma(\pi^0 e^+e^-)/\Gamma_{\text{total}}$  $\Gamma_{201}/\Gamma$ 

A test for the  $\Delta C = 1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<4.5 \times 10^{-5}$	90	0	FREYBERGER	96	CLE2 $e^+e^- \approx \gamma(4S)$

 $\Gamma(\pi^0 \mu^+\mu^-)/\Gamma_{\text{total}}$  $\Gamma_{202}/\Gamma$ 

A test for the  $\Delta C=1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<1.8 \times 10^{-4}$	90	2	KODAMA	95	E653 $\pi^-$ emulsion 600 GeV
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$					
$<5.4 \times 10^{-4}$	90	3	FREYBERGER	96	CLE2 $e^+e^- \approx \gamma(4S)$

### $\Gamma(\eta e^+ e^-)/\Gamma_{\text{total}}$

$\Gamma_{203}/\Gamma$

A test for the  $\Delta C = 1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<1.1 \times 10^{-4}$	90	0	FREYBERGER 96	CLE2	$e^+ e^- \approx \gamma(4S)$

### $\Gamma(\eta \mu^+ \mu^-)/\Gamma_{\text{total}}$

$\Gamma_{204}/\Gamma$

A test for the  $\Delta C = 1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<5.3 \times 10^{-4}$	90	0	FREYBERGER 96	CLE2	$e^+ e^- \approx \gamma(4S)$

### $\Gamma(\pi^+ \pi^- e^+ e^-)/\Gamma_{\text{total}}$

$\Gamma_{205}/\Gamma$

A test for the  $\Delta C = 1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<3.73 \times 10^{-4}$	90	9	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV

### $\Gamma(\rho^0 e^+ e^-)/\Gamma_{\text{total}}$

$\Gamma_{206}/\Gamma$

A test for the  $\Delta C = 1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<1.0 \times 10^{-4}$	90	2	127 FREYBERGER 96	CLE2	$e^+ e^- \approx \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<1.24 \times 10^{-4}$	90	1	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV
$<4.5 \times 10^{-4}$	90	2	HAAS	88 CLEO	$e^+ e^-$ 10 GeV

127 This FREYBERGER 96 limit is obtained using a phase-space model. The limit changes to  $< 1.8 \times 10^{-4}$  using a photon pole amplitude model.

### $\Gamma(\pi^+ \pi^- \mu^+ \mu^-)/\Gamma_{\text{total}}$

$\Gamma_{207}/\Gamma$

A test for the  $\Delta C = 1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<3.0 \times 10^{-5}$	90	2	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV

### $\Gamma(\rho^0 \mu^+ \mu^-)/\Gamma_{\text{total}}$

$\Gamma_{208}/\Gamma$

A test for the  $\Delta C = 1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<2.2 \times 10^{-5}$	90	0	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<4.9 \times 10^{-4}$	90	1	128 FREYBERGER 96	CLE2	$e^+ e^- \approx \gamma(4S)$
$<2.3 \times 10^{-4}$	90	0	KODAMA	95 E653	$\pi^-$ emulsion 600 GeV
$<8.1 \times 10^{-4}$	90	5	HAAS	88 CLEO	$e^+ e^-$ 10 GeV

128 This FREYBERGER 96 limit is obtained using a phase-space model. The limit changes to  $< 4.5 \times 10^{-4}$  using a photon pole amplitude model.

### $\Gamma(\omega e^+ e^-)/\Gamma_{\text{total}}$

$\Gamma_{209}/\Gamma$

A test for the  $\Delta C = 1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<1.8 \times 10^{-4}$	90	1	129 FREYBERGER 96	CLE2	$e^+ e^- \approx \gamma(4S)$

129 This FREYBERGER 96 limit is obtained using a phase-space model. The limit changes to  $< 2.7 \times 10^{-4}$  using a photon pole amplitude model.

### $\Gamma(\omega \mu^+ \mu^-)/\Gamma_{\text{total}}$

$\Gamma_{210}/\Gamma$

A test for the  $\Delta C = 1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<8.3 \times 10^{-4}$	90	0	130 FREYBERGER 96	CLE2	$e^+ e^- \approx \gamma(4S)$

130 This FREYBERGER 96 limit is obtained using a phase-space model. The limit changes to  $< 6.5 \times 10^{-4}$  using a photon pole amplitude model.

### $\Gamma(K^- K^+ e^+ e^-)/\Gamma_{\text{total}}$

$\Gamma_{211}/\Gamma$

A test for the  $\Delta C = 1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<3.15 \times 10^{-4}$	90	9	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV

### $\Gamma(\phi e^+ e^-)/\Gamma_{\text{total}}$

$\Gamma_{212}/\Gamma$

A test for the  $\Delta C = 1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<5.2 \times 10^{-5}$	90	2	131 FREYBERGER 96	CLE2	$e^+ e^- \approx \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<5.9 \times 10^{-5}$  90 0 AITALA 01C E791  $\pi^-$  nucleus, 500 GeV

131 This FREYBERGER 96 limit is obtained using a phase-space model. The limit changes to  $< 7.6 \times 10^{-5}$  using a photon pole amplitude model.

### $\Gamma(K^- K^+ \mu^+ \mu^-)/\Gamma_{\text{total}}$

$\Gamma_{213}/\Gamma$

A test for the  $\Delta C = 1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<3.3 \times 10^{-5}$	90	0	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV

### $\Gamma(\phi \mu^+ \mu^-)/\Gamma_{\text{total}}$

$\Gamma_{214}/\Gamma$

A test for the  $\Delta C = 1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<3.1 \times 10^{-5}$	90	0	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<4.1 \times 10^{-4}$  90 0 132 FREYBERGER 96 CLE2  $e^+ e^- \approx \gamma(4S)$

132 This FREYBERGER 96 limit is obtained using a phase-space model. The limit changes to  $< 2.4 \times 10^{-4}$  using a photon pole amplitude model.

### $\Gamma(\bar{K}^0 e^+ e^-)/\Gamma_{\text{total}}$

$\Gamma_{215}/\Gamma$

Not a useful test for  $\Delta C = 1$  weak neutral current because both quarks must change flavor.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<1.1 \times 10^{-4}$	90	0	FREYBERGER 96	CLE2	$e^+ e^- \approx \gamma(4S)$
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$					
$<1.7 \times 10^{-3}$	90		ADLER	89C MRK3	$e^+ e^- 3.77 \text{ GeV}$

### $\Gamma(\bar{K}^0 \mu^+ \mu^-)/\Gamma_{\text{total}}$

$\Gamma_{216}/\Gamma$

Not a useful test for  $\Delta C = 1$  weak neutral current because both quarks must change flavor.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<2.6 \times 10^{-4}$	90	2	KODAMA	95	E653 $\pi^-$ emulsion 600 GeV
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$					
$<6.7 \times 10^{-4}$	90	1	FREYBERGER 96	CLE2	$e^+ e^- \approx \gamma(4S)$

### $\Gamma(K^- \pi^+ e^+ e^-)/\Gamma_{\text{total}}$

$\Gamma_{217}/\Gamma$

A test for the  $\Delta C = 1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<3.85 \times 10^{-4}$	90	6	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV

### $\Gamma(\bar{K}^*(892)^0 e^+ e^-)/\Gamma_{\text{total}}$

$\Gamma_{218}/\Gamma$

Not a useful test for  $\Delta C = 1$  weak neutral current because both quarks must change flavor.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<4.7 \times 10^{-5}$	90	2	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$					
$<1.4 \times 10^{-4}$	90	1	133 FREYBERGER 96	CLE2	$e^+ e^- \approx \gamma(4S)$

133 This FREYBERGER 96 limit is obtained using a phase-space model. The limit changes to  $< 2.0 \times 10^{-4}$  using a photon pole amplitude model.

### $\Gamma(K^- \pi^+ \mu^+ \mu^-)/\Gamma_{\text{total}}$

$\Gamma_{219}/\Gamma$

A test for the  $\Delta C = 1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<3.59 \times 10^{-4}$	90	12	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV

### $\Gamma(\bar{K}^*(892)^0 \mu^+ \mu^-)/\Gamma_{\text{total}}$

$\Gamma_{220}/\Gamma$

Not a useful test for  $\Delta C = 1$  weak neutral current because both quarks must change flavor.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<2.4 \times 10^{-5}$	90	3	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$					
$<1.18 \times 10^{-3}$	90	1	134 FREYBERGER 96	CLE2	$e^+ e^- \approx \gamma(4S)$

134 This FREYBERGER 96 limit is obtained using a phase-space model. The limit changes to  $< 1.0 \times 10^{-3}$  using a photon pole amplitude model.

### $\Gamma(\pi^+\pi^-\pi^0\mu^+\mu^-)/\Gamma_{\text{total}}$

$\Gamma_{221}/\Gamma$

A test for the  $\Delta C=1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$< 8.1 \times 10^{-4}$	90	1	KODAMA	95	E653 $\pi^-$ emulsion 600 GeV

### $\Gamma(\mu^\pm e^\mp)/\Gamma_{\text{total}}$

$\Gamma_{222}/\Gamma$

A test of lepton family number conservation.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$< 8.1 \times 10^{-7}$	90	0	AUBERT,B	04Y	BABR $e^+ e^- \approx \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$< 1.72 \times 10^{-5}$	90		PRIPSTEIN	00	E789 $p$ nucleus, 800 GeV
$< 8.1 \times 10^{-6}$	90		AITALA	99G	E791 $\pi^- N$ 500 GeV
$< 1.9 \times 10^{-5}$	90	2	<sup>135</sup> FREYBERGER	96	CLE2 $e^+ e^- \approx \gamma(4S)$
$< 1.0 \times 10^{-4}$	90	4	ALBRECHT	88G	ARG $e^+ e^-$ 10 GeV
$< 2.7 \times 10^{-4}$	90	9	HAAS	88	CLEO $e^+ e^-$ 10 GeV
$< 1.2 \times 10^{-4}$	90		BECKER	87C	MRK3 $e^+ e^-$ 3.77 GeV
$< 9 \times 10^{-4}$	90		PALKA	87	SILI 200 GeV $\pi p$
$< 21 \times 10^{-4}$	90	0	<sup>136</sup> RILES	87	MRK2 $e^+ e^-$ 29 GeV

<sup>135</sup> This is the corrected result given in the erratum to FREYBERGER 96.

<sup>136</sup> RILES 87 assumes  $B(D \rightarrow K\pi) = 3.0\%$  and has production model dependency.

### $\Gamma(\pi^0 e^\pm \mu^\mp)/\Gamma_{\text{total}}$

$\Gamma_{223}/\Gamma$

A test of lepton family number conservation. The value is for the sum of the two charge states.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$< 8.6 \times 10^{-5}$	90	2	FREYBERGER 96	CLE2	$e^+ e^- \approx \gamma(4S)$

### $\Gamma(\eta e^\pm \mu^\mp)/\Gamma_{\text{total}}$

$\Gamma_{224}/\Gamma$

A test of lepton family number conservation. The value is for the sum of the two charge states.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$< 1.0 \times 10^{-4}$	90	0	FREYBERGER 96	CLE2	$e^+ e^- \approx \gamma(4S)$

### $\Gamma(\pi^+\pi^- e^\pm \mu^\mp)/\Gamma_{\text{total}}$

$\Gamma_{225}/\Gamma$

A test of lepton family-number conservation. The value is for the sum of the two charge states.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$< 1.5 \times 10^{-5}$	90	1	AITALA	01C	E791 $\pi^-$ nucleus, 500 GeV

### $\Gamma(\rho^0 e^\pm \mu^\mp)/\Gamma_{\text{total}}$

$\Gamma_{226}/\Gamma$

A test of lepton family number conservation. The value is for the sum of the two charge states.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$< 4.9 \times 10^{-5}$	90	0	<sup>137</sup> FREYBERGER 96	CLE2	$e^+ e^- \approx \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$< 6.6 \times 10^{-5}$	90	1	AITALA	01C	E791 $\pi^-$ nucleus, 500 GeV
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<sup>137</sup> This FREYBERGER 96 limit is obtained using a phase-space model. The limit changes to  $< 5.0 \times 10^{-5}$  using a photon pole amplitude model.

### $\Gamma(\omega e^\pm \mu^\mp)/\Gamma_{\text{total}}$

$\Gamma_{227}/\Gamma$

A test of lepton family number conservation. The value is for the sum of the two charge states.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<1.2 \times 10^{-4}$	90	0	138 FREYBERGER 96	CLE2	$e^+ e^- \approx \gamma(4S)$

<sup>138</sup> This FREYBERGER 96 limit is obtained using a phase-space model. The same limit is obtained using a photon pole amplitude model.

### $\Gamma(K^- K^+ e^\pm \mu^\mp)/\Gamma_{\text{total}}$

$\Gamma_{228}/\Gamma$

A test of lepton family-number conservation. The value is for the sum of the two charge states.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<1.8 \times 10^{-4}$	90	5	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV

### $\Gamma(\phi e^\pm \mu^\mp)/\Gamma_{\text{total}}$

$\Gamma_{229}/\Gamma$

A test of lepton family number conservation. The value is for the sum of the two charge states.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<3.4 \times 10^{-5}$	90	0	139 FREYBERGER 96	CLE2	$e^+ e^- \approx \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<4.7 \times 10^{-5}$  90 0 AITALA 01C E791  $\pi^-$  nucleus, 500 GeV

<sup>139</sup> This FREYBERGER 96 limit is obtained using a phase-space model. The limit changes to  $<3.3 \times 10^{-5}$  using a photon pole amplitude model.

### $\Gamma(\bar{K}^0 e^\pm \mu^\mp)/\Gamma_{\text{total}}$

$\Gamma_{230}/\Gamma$

A test of lepton family number conservation. The value is for the sum of the two charge states.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<1.0 \times 10^{-4}$	90	0	FREYBERGER 96	CLE2	$e^+ e^- \approx \gamma(4S)$

### $\Gamma(K^- \pi^+ e^\pm \mu^\mp)/\Gamma_{\text{total}}$

$\Gamma_{231}/\Gamma$

A test of lepton family-number conservation. The value is for the sum of the two charge states.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<5.53 \times 10^{-4}$	90	15	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV

### $\Gamma(\bar{K}^*(892)^0 e^\pm \mu^\mp)/\Gamma_{\text{total}}$

$\Gamma_{232}/\Gamma$

A test of lepton family number conservation. The value is for the sum of the two charge states.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<8.3 \times 10^{-5}$	90	9	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<1.0 \times 10^{-4}$  90 0 140 FREYBERGER 96 CLE2  $e^+ e^- \approx \gamma(4S)$

<sup>140</sup> This FREYBERGER 96 limit is obtained using a phase-space model. The same limit is obtained using a photon pole amplitude model.

### $\Gamma(\pi^- \pi^- e^+ e^+ + \text{c.c.})/\Gamma_{\text{total}}$

$\Gamma_{233}/\Gamma$

A test of lepton-number conservation. The value is for the sum of the two charge states.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<1.12 \times 10^{-4}$	90	1	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV

$\Gamma(\pi^-\pi^-\mu^+\mu^++\text{c.c.})/\Gamma_{\text{total}}$

$\Gamma_{234}/\Gamma$

A test of lepton-number conservation. The value is for the sum of the two charge states.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<2.9 \times 10^{-5}$	90	1	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV

$\Gamma(K^-\pi^-e^+e^++\text{c.c.})/\Gamma_{\text{total}}$

$\Gamma_{235}/\Gamma$

A test of lepton-number conservation. The value is for the sum of the two charge states.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<2.06 \times 10^{-4}$	90	2	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV

$\Gamma(K^-\pi^-\mu^+\mu^++\text{c.c.})/\Gamma_{\text{total}}$

$\Gamma_{236}/\Gamma$

A test of lepton-number conservation. The value is for the sum of the two charge states.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<3.9 \times 10^{-4}$	90	14	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV

$\Gamma(K^-K^-e^+e^++\text{c.c.})/\Gamma_{\text{total}}$

$\Gamma_{237}/\Gamma$

A test of lepton-number conservation. The value is for the sum of the two charge states.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<1.52 \times 10^{-4}$	90	2	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV

$\Gamma(K^-K^-\mu^+\mu^++\text{c.c.})/\Gamma_{\text{total}}$

$\Gamma_{238}/\Gamma$

A test of lepton-number conservation. The value is for the sum of the two charge states.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<9.4 \times 10^{-5}$	90	1	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV

$\Gamma(\pi^-\pi^-e^+\mu^++\text{c.c.})/\Gamma_{\text{total}}$

$\Gamma_{239}/\Gamma$

A test of lepton-number conservation. The value is for the sum of the two charge states.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<7.9 \times 10^{-5}$	90	4	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV

$\Gamma(K^-\pi^-e^+\mu^++\text{c.c.})/\Gamma_{\text{total}}$

$\Gamma_{240}/\Gamma$

A test of lepton-number conservation. The value is for the sum of the two charge states.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<2.18 \times 10^{-4}$	90	7	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV

$\Gamma(K^-K^-e^+\mu^++\text{c.c.})/\Gamma_{\text{total}}$

$\Gamma_{241}/\Gamma$

A test of lepton-number conservation. The value is for the sum of the two charge states.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<5.7 \times 10^{-5}$	90	0	AITALA	01C E791	$\pi^-$ nucleus, 500 GeV

## $D^0$ CP-VIOLATING DECAY-RATE ASYMMETRIES

### $A_{CP}(K^+ K^-)$ in $D^0, \bar{D}^0 \rightarrow K^+ K^-$

This is the difference between  $D^0$  and  $\bar{D}^0$  partial widths for these modes divided by the sum of the widths. The  $D^0$  and  $\bar{D}^0$  are distinguished by the charge of the parent  $D^*: D^{*+} \rightarrow D^0 \pi^+$  and  $D^{*-} \rightarrow \bar{D}^0 \pi^-$ .

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.014±0.010 OUR AVERAGE</b>				
+0.020±0.012±0.006	141	ACOSTA	05C	CDF $p\bar{p}, \sqrt{s}=1.96$ TeV
0.000±0.022±0.008	3023	141 CSORNA	02	CLE2 $e^+ e^- \approx \gamma(4S)$
-0.001±0.022±0.015	3330	141 LINK	00B	FOCS
-0.010±0.049±0.012	609	141 AITALA	98C	E791 $-0.093 < A_{CP} < +0.073$ (90% CL)
+0.080±0.061		BARTEL	95	CLE2 $-0.022 < A_{CP} < +0.18$ (90% CL)
+0.024±0.084		141 FRABETTI	94I	E687 $-0.11 < A_{CP} < +0.16$ (90% CL)

141 FRABETTI 94I, AITALA 98C, LINK 00B, CSORNA 02, and ACOSTA 05C measure  $N(D^0 \rightarrow K^+ K^-)/N(D^0 \rightarrow K^- \pi^+)$ , the ratio of numbers of events observed, and similarly for the  $\bar{D}^0$ .

### $A_{CP}(K_S^0 K_S^0)$ in $D^0, \bar{D}^0 \rightarrow K_S^0 K_S^0$

This is the difference between  $D^0$  and  $\bar{D}^0$  partial widths for these modes divided by the sum of the widths. The  $D^0$  and  $\bar{D}^0$  are distinguished by the charge of the parent  $D^*: D^{*+} \rightarrow D^0 \pi^+$  and  $D^{*-} \rightarrow \bar{D}^0 \pi^-$ .

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>-0.23±0.19</b>	65	BONVICINI	01	CLE2 $e^+ e^- \approx 10.6$ GeV

### $A_{CP}(\pi^+ \pi^-)$ in $D^0, \bar{D}^0 \rightarrow \pi^+ \pi^-$

This is the difference between  $D^0$  and  $\bar{D}^0$  partial widths for these modes divided by the sum of the widths. The  $D^0$  and  $\bar{D}^0$  are distinguished by the charge of the parent  $D^*: D^{*+} \rightarrow D^0 \pi^+$  and  $D^{*-} \rightarrow \bar{D}^0 \pi^-$ .

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.013±0.012 OUR AVERAGE</b>				
+0.010±0.013±0.006	142	ACOSTA	05C	CDF $p\bar{p}, \sqrt{s}=1.96$ TeV
0.019±0.032±0.008	1136	142 CSORNA	02	CLE2 $e^+ e^- \approx \gamma(4S)$
+0.048±0.039±0.025	1177	142 LINK	00B	FOCS
-0.049±0.078±0.030	343	142 AITALA	98C	E791 $-0.186 < A_{CP} < +0.088$ (90% CL)

142 AITALA 98C, LINK 00B, CSORNA 02, and ACOSTA 05C measure  $N(D^0 \rightarrow \pi^+ \pi^-)/N(D^0 \rightarrow K^- \pi^+)$ , the ratio of numbers of events observed, and similarly for the  $\bar{D}^0$ .

### $A_{CP}(\pi^0 \pi^0)$ in $D^0, \bar{D}^0 \rightarrow \pi^0 \pi^0$

This is the difference between  $D^0$  and  $\bar{D}^0$  partial widths for these modes divided by the sum of the widths. The  $D^0$  and  $\bar{D}^0$  are distinguished by the charge of the parent  $D^*: D^{*+} \rightarrow D^0 \pi^+$  and  $D^{*-} \rightarrow \bar{D}^0 \pi^-$ .

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>+0.001±0.048</b>	810	BONVICINI	01	CLE2 $e^+ e^- \approx 10.6$ GeV

**$A_{CP}(\pi^+\pi^-\pi^0)$  in  $D^0, \bar{D}^0 \rightarrow \pi^+\pi^-\pi^0$** 

This is the difference between  $D^0$  and  $\bar{D}^0$  partial widths for these modes divided by the sum of the widths. The  $D^0$  and  $\bar{D}^0$  are distinguished by the charge of the parent  $D^*: D^{*+} \rightarrow D^0\pi^+$  and  $D^{*-} \rightarrow \bar{D}^0\pi^-$ .

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>0.01^{+0.09}_{-0.07} \pm 0.05</math></b>	CRONIN-HEN..05	CLEO	$e^+e^- \approx 10$ GeV

 **$A_{CP}(K_S^0\phi)$  in  $D^0, \bar{D}^0 \rightarrow K_S^0\phi$** 

This is the difference between  $D^0$  and  $\bar{D}^0$  partial widths for these modes divided by the sum of the widths. The  $D^0$  and  $\bar{D}^0$  are distinguished by the charge of the parent  $D^*: D^{*+} \rightarrow D^0\pi^+$  and  $D^{*-} \rightarrow \bar{D}^0\pi^-$ .

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>-0.028 \pm 0.094</math></b>	BARTELTT	95	CLE2 $-0.182 < A_{CP} < +0.126$ (90%CL)

 **$A_{CP}(K_S^0\pi^0)$  in  $D^0, \bar{D}^0 \rightarrow K_S^0\pi^0$** 

This is the difference between  $D^0$  and  $\bar{D}^0$  partial widths for these modes divided by the sum of the widths. The  $D^0$  and  $\bar{D}^0$  are distinguished by the charge of the parent  $D^*: D^{*+} \rightarrow D^0\pi^+$  and  $D^{*-} \rightarrow \bar{D}^0\pi^-$ .

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b><math>+0.001 \pm 0.013</math></b>	9099	BONVICINI	01	CLE2 $e^+e^- \approx 10.6$ GeV
<b>• • • We do not use the following data for averages, fits, limits, etc. • • •</b>				
$-0.018 \pm 0.030$		BARTELTT	95	CLE2 See BONVICINI 01

 **$A_{CP}(K^\pm\pi^\mp)$  in  $D^0 \rightarrow K^+\pi^-, \bar{D}^0 \rightarrow K^-\pi^+$** 

This is the difference between  $D^0$  and  $\bar{D}^0$  partial widths for these modes divided by the sum of the widths. The  $D^0$  and  $\bar{D}^0$  are distinguished by the charge of the parent  $D^*: D^{*+} \rightarrow D^0\pi^+$  and  $D^{*-} \rightarrow \bar{D}^0\pi^-$ .

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.05 ± 0.04 OUR AVERAGE</b>				
$+0.023 \pm 0.047$	$4024 \pm 88$	143 ZHANG	06 BELL	$e^+e^-$
$+0.18 \pm 0.14 \pm 0.04$		144 LINK	05H FOCS	$\gamma$ nucleus
$+0.095 \pm 0.061 \pm 0.083$		145 AUBERT	03Z BABR	$e^+e^-$ , 10.6 GeV
$+0.02^{+0.19}_{-0.20} \pm 0.01$	45	146 GODANG	00 CLE2	$-0.43 < A_{CP} < +0.34$ (95%CL)

**• • • We do not use the following data for averages, fits, limits, etc. • • •**

$-0.080 \pm 0.077$        $845 \pm 40$       147 LI      05A BELL See ZHANG 06

143 This ZHANG 06 result allows mixing.

144 This LINK 05H result assumes no mixing. If mixing is allowed, it becomes  $0.13^{+0.33}_{-0.25} \pm 0.10$ .

145 This AUBERT 03Z limit assumes no mixing. If mixing is allowed, the 95% confidence-level interval is  $(-2.8 < A_D < 4.9) \times 10^{-3}$ .

146 This GODANG 00 result assumes no  $D^0-\bar{D}^0$  mixing; it becomes  $-0.01^{+0.16}_{-0.17} \pm 0.01$  when mixing is allowed.

147 This LI 05A result allows mixing.

**$A_{CP}(K^\mp\pi^\pm\pi^0)$  in  $D^0 \rightarrow K^-\pi^+\pi^0, \bar{D}^0 \rightarrow K^+\pi^-\pi^0$** 

This is the difference between  $D^0$  and  $\bar{D}^0$  partial widths for these modes divided by the sum of the widths. The  $D^0$  and  $\bar{D}^0$  are distinguished by the charge of the parent  $D^*$ :  $D^{*+} \rightarrow D^0\pi^+$  and  $D^{*-} \rightarrow \bar{D}^0\pi^-$ .

VALUE	DOCUMENT ID	TECN	COMMENT
<b>-0.031 ± 0.086</b>	148 KOPP	01 CLE2	$e^+e^- \approx 10.6$ GeV

148 KOPP 01 fits separately the  $D^0$  and  $\bar{D}^0$  Dalitz plots and then calculates the integrated difference of normalized densities divided by the integrated sum.

 **$A_{CP}(K^\pm\pi^\mp\pi^0)$  in  $D^0 \rightarrow K^+\pi^-\pi^0, \bar{D}^0 \rightarrow K^-\pi^+\pi^0$** 

This is the difference between  $D^0$  and  $\bar{D}^0$  partial widths for these modes divided by the sum of the widths. The  $D^0$  and  $\bar{D}^0$  are distinguished by the charge of the parent  $D^*$ :  $D^{*+} \rightarrow D^0\pi^+$  and  $D^{*-} \rightarrow \bar{D}^0\pi^-$ .

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.00 ± 0.05 OUR AVERAGE</b>				
-0.006 ± 0.053	$1978 \pm 104$	TIAN	05 BELL	$e^+e^- \approx \gamma(4S)$
+0.09 $^{+0.25}_{-0.22}$	38	BRANDENB...	01 CLE2	$e^+e^- \approx \gamma(4S)$

 **$A_{CP}(K_S^0\pi^+\pi^-)$  in  $D^0, \bar{D}^0 \rightarrow K_S^0\pi^+\pi^-$** 

This is the difference between  $D^0$  and  $\bar{D}^0$  partial widths for these modes divided by the sum of the widths. The  $D^0$  and  $\bar{D}^0$  are distinguished by the charge of the parent  $D^*$ :  $D^{*+} \rightarrow D^0\pi^+$  and  $D^{*-} \rightarrow \bar{D}^0\pi^-$ .

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>-0.009 ± 0.021 <math>^{+0.016}_{-0.057}</math></b>	4854	149 ASNER	04A CLEO	$e^+e^- \approx 10$ GeV

149 This is the overall result of ASNER 04A;  $CP$ -violating limits are also given below for each of the 10 resonant submodes found in an amplitude analysis of the  $D^0$  and  $\bar{D}^0 \rightarrow K_S^0\pi^+\pi^-$  Dalitz plots. These limits range from  $< 3.5 \times 10^{-4}$  to  $28.4 \times 10^{-4}$  at 95% CL.

 **$A_{CP}(K^*(892)^\mp\pi^\pm \rightarrow K_S^0\pi^+\pi^-)$  in  $D^0 \rightarrow K^{*-}\pi^+, \bar{D}^0 \rightarrow K^{*+}\pi^-$** 

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;3.5</b>	95	150 ASNER	04A CLEO	Dalitz fit, 4854 $D^0 + \bar{D}^0$ evts

150 This ASNER 04A limit comes from an amplitude analysis of the  $D^0$  and  $\bar{D}^0 \rightarrow K_S^0\pi^+\pi^-$  Dalitz plots.

 **$A_{CP}(K^*(892)^\pm\pi^\mp \rightarrow K_S^0\pi^+\pi^-)$  in  $D^0 \rightarrow K^{*+}\pi^-, \bar{D}^0 \rightarrow K^{*-}\pi^+$** 

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;7.8</b>	95	151 ASNER	04A CLEO	Dalitz fit, 4854 $D^0 + \bar{D}^0$ evts

151 This ASNER 04A limit comes from an amplitude analysis of the  $D^0$  and  $\bar{D}^0 \rightarrow K_S^0\pi^+\pi^-$  Dalitz plots.

 **$A_{CP}(K_S^0\rho^0 \rightarrow K_S^0\pi^+\pi^-)$  in  $D^0 \rightarrow \bar{K}^0\rho^0, \bar{D}^0 \rightarrow K^0\rho^0$** 

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;4.8</b>	95	152 ASNER	04A CLEO	Dalitz fit, 4854 $D^0 + \bar{D}^0$ evts

152 This ASNER 04A limit comes from an amplitude analysis of the  $D^0$  and  $\bar{D}^0 \rightarrow K_S^0\pi^+\pi^-$  Dalitz plots.

$A_{CP}(K_S^0 \omega \rightarrow K_S^0 \pi^+ \pi^-)$  in  $D^0 \rightarrow \bar{K}^0 \omega, \bar{D}^0 \rightarrow K^0 \omega$ 

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<9.2	95	153 ASNER	04A CLEO	Dalitz fit, 4854 $D^0 + \bar{D}^0$ evts

153 This ASNER 04A limit comes from an amplitude analysis of the  $D^0$  and  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  Dalitz plots.

 $A_{CP}(K_S^0 f_0(980) \rightarrow K_S^0 \pi^+ \pi^-)$  in  $D^0 \rightarrow \bar{K}^0 f_0(980), \bar{D}^0 \rightarrow K^0 f_0(980)$ 

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<6.8	95	154 ASNER	04A CLEO	Dalitz fit, 4854 $D^0 + \bar{D}^0$ evts

154 This ASNER 04A limit comes from an amplitude analysis of the  $D^0$  and  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  Dalitz plots.

 $A_{CP}(K_S^0 f_2(1270) \rightarrow K_S^0 \pi^+ \pi^-)$  in  $D^0 \rightarrow \bar{K}^0 f_2(1270), \bar{D}^0 \rightarrow K^0 f_2(1270)$ 

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<13.5	95	155 ASNER	04A CLEO	Dalitz fit, 4854 $D^0 + \bar{D}^0$ evts

155 This ASNER 04A limit comes from an amplitude analysis of the  $D^0$  and  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  Dalitz plots.

 $A_{CP}(K_S^0 f_0(1370) \rightarrow K_S^0 \pi^+ \pi^-)$  in  $D^0 \rightarrow \bar{K}^0 f_0(1370), \bar{D}^0 \rightarrow K^0 f_0(1370)$ 

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<25.5	95	156 ASNER	04A CLEO	Dalitz fit, 4854 $D^0 + \bar{D}^0$ evts

156 This ASNER 04A limit comes from an amplitude analysis of the  $D^0$  and  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  Dalitz plots.

 $A_{CP}(K_0^*(1430)^{\mp} \pi^{\pm} \rightarrow K_S^0 \pi^+ \pi^-)$  in  $D^0 \rightarrow K_0^*(1430)^- \pi^+, \bar{D}^0 \rightarrow K_0^*(1430)^+ \pi^-$ 

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<9.0	95	157 ASNER	04A CLEO	Dalitz fit, 4854 $D^0 + \bar{D}^0$ evts

157 This ASNER 04A limit comes from an amplitude analysis of the  $D^0$  and  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  Dalitz plots.

 $A_{CP}(K_2^*(1430)^{\mp} \pi^{\pm} \rightarrow K_S^0 \pi^+ \pi^-)$  in  $D^0 \rightarrow K_2^*(1430)^- \pi^+, \bar{D}^0 \rightarrow K_2^*(1430)^+ \pi^-$ 

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<6.5	95	158 ASNER	04A CLEO	Dalitz fit, 4854 $D^0 + \bar{D}^0$ evts

158 This ASNER 04A limit comes from an amplitude analysis of the  $D^0$  and  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  Dalitz plots.

 $A_{CP}(K^*(1680)^{\mp} \pi^{\pm} \rightarrow K_S^0 \pi^+ \pi^-)$  in  $D^0 \rightarrow K^*(1680)^- \pi^+, \bar{D}^0 \rightarrow K^*(1680)^+ \pi^-$ 

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<28.4	95	159 ASNER	04A CLEO	Dalitz fit, 4854 $D^0 + \bar{D}^0$ evts

159 This ASNER 04A limit comes from an amplitude analysis of the  $D^0$  and  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  Dalitz plots.

**$A_{CP}(K^\pm\pi^\mp\pi^+\pi^-)$  in  $D^0 \rightarrow K^+\pi^-\pi^+\pi^-$ ,  $\bar{D}^0 \rightarrow K^-\pi^+\pi^+\pi^-$** 

This is the difference between  $D^0$  and  $\bar{D}^0$  partial widths for these modes divided by the sum of the widths. The  $D^0$  and  $\bar{D}^0$  are distinguished by the charge of the parent  $D^*$ :  $D^{*+} \rightarrow D^0\pi^+$  and  $D^{*-} \rightarrow \bar{D}^0\pi^-$ .

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>-0.018±0.044</b>	$1721 \pm 75$	TIAN	05	BELL $e^+e^- \approx \gamma(4S)$

 **$A_{CP}(K^+K^-\pi^+\pi^-)$  in  $D^0$ ,  $\bar{D}^0 \rightarrow K^+K^-\pi^+\pi^-$** 

This is the difference between  $D^0$  and  $\bar{D}^0$  partial widths for these modes divided by the sum of the widths. The  $D^0$  and  $\bar{D}^0$  are distinguished by the charge of the parent  $D^*$ :  $D^{*+} \rightarrow D^0\pi^+$  and  $D^{*-} \rightarrow \bar{D}^0\pi^-$ .

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>-0.082±0.056±0.047</b>	$828 \pm 46$	LINK	05E	FOCS $\gamma A$ , $\bar{E}_\gamma \approx 180$ GeV

 **$D^0$ - $\bar{D}^0$  T-VIOLATING DECAY-RATE ASYMMETRIES**

$D^0$  and  $\bar{D}^0$  are distinguished by the charge of the parent  $D^*$ :  $D^{*+} \rightarrow D^0\pi^+$  and  $D^{*-} \rightarrow \bar{D}^0\pi^-$ .

 **$A_{Tviol}(K^+K^-\pi^+\pi^-)$  in  $D^0$ ,  $\bar{D}^0 \rightarrow K^+K^-\pi^+\pi^-$** 

$C_T \equiv \vec{p}_{K^+} \cdot (\vec{p}_{\pi^+} \times \vec{p}_{\pi^-})$  is a  $T$ -odd correlation of the  $K^+$ ,  $\pi^+$ , and  $\pi^-$  momenta for the  $D^0$ .  $\bar{C}_T \equiv \vec{p}_{K^-} \cdot (\vec{p}_{\pi^-} \times \vec{p}_{\pi^+})$  is the corresponding quantity for the  $\bar{D}^0$ .  $A_T \equiv [\Gamma(C_T > 0) - \Gamma(C_T < 0)] / [\Gamma(C_T > 0) + \Gamma(C_T < 0)]$  would, in the absence of strong phases, test for  $T$  violation in  $D^0$  decays (the  $\Gamma$ 's are partial widths). With  $\bar{A}_T \equiv [\Gamma(-\bar{C}_T > 0) - \Gamma(-\bar{C}_T < 0)] / [\Gamma(-\bar{C}_T > 0) + \Gamma(-\bar{C}_T < 0)]$ , the asymmetry  $A_{Tviol} \equiv \frac{1}{2}(A_T - \bar{A}_T)$  tests for  $T$  violation even with nonzero strong phases.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>+0.010±0.057±0.037</b>	$828 \pm 46$	LINK	05E	FOCS $\gamma A$ , $\bar{E}_\gamma \approx 180$ GeV

 **$D^0$  CPT-VIOLATING DECAY-RATE ASYMMETRIES** **$A_{CPT}(K^\mp\pi^\pm)$  in  $D^0 \rightarrow K^-\pi^+$ ,  $\bar{D}^0 \rightarrow K^+\pi^-$** 

$A_{CPT}(t)$  is defined in terms of the time-dependent decay probabilities  $P(D^0 \rightarrow K^-\pi^+)$  and  $\bar{P}(\bar{D}^0 \rightarrow K^+\pi^-)$  by  $A_{CPT}(t) = (\bar{P} - P)/(\bar{P} + P)$ . For small mixing parameters  $x \equiv \Delta m/\Gamma$  and  $y \equiv \Delta\Gamma/2\Gamma$  (as is the case), and times  $t$ ,  $A_{CPT}(t)$  reduces to  $[y \operatorname{Re} \xi - x \operatorname{Im} \xi] \Gamma t$ , where  $\xi$  is the  $CPT$ -violating parameter.

The following is actually  $y \operatorname{Re} \xi - x \operatorname{Im} \xi$ .

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.0083±0.0065±0.0041</b>	LINK	03B	FOCS $\gamma$ nucleus, $\bar{E}_\gamma \approx 180$ GeV

 **$D^0 \rightarrow K^*(892)^-\ell^+\nu_\ell$  FORM FACTORS** **$r_V \equiv V(0)/A_1(0)$  in  $D^0 \rightarrow K^*(892)^-\ell^+\nu_\ell$** 

VALUE	DOCUMENT ID	TECN	COMMENT
<b>1.71±0.68±0.34</b>	LINK	05B	FOCS $K^*(892)^-\mu^+\nu_\mu$

$$r_2 \equiv A_2(0)/A_1(0) \text{ in } D^0 \rightarrow K^*(892)^- \ell^+ \nu_\ell$$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.91±0.37±0.10</b>	LINK	05B FOCS	$K^*(892)^- \mu^+ \nu_\mu$

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KODAMA	91	PRL 66 1819	K. Kodama <i>et al.</i>	(FNAL E653 Collab.)
ALBRECHT	90C	ZPHY C46 9	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ALEXANDER	90	PRL 65 1184	J. Alexander <i>et al.</i>	(CLEO Collab.)
ALEXANDER	90B	PRL 65 1531	J. Alexander <i>et al.</i>	(CLEO Collab.)
ALVAREZ	90	ZPHY C47 539	M.P. Alvarez <i>et al.</i>	(CERN NA14/2 Collab.)
ANJOS	90D	PR D42 2414	J.C. Anjos <i>et al.</i>	(FNAL E691 Collab.)
BARLAG	90C	ZPHY C46 563	S. Barlag <i>et al.</i>	(ACCMOR Collab.)
ADLER	89	PRL 62 1821	J. Adler <i>et al.</i>	(Mark III Collab.)
ADLER	89C	PR D40 906	J. Adler <i>et al.</i>	(Mark III Collab.)
ALBRECHT	89D	ZPHY C43 181	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ANJOS	89F	PRL 62 1587	J.C. Anjos <i>et al.</i>	(FNAL E691 Collab.)
ABACHI	88	PL B205 411	S. Abachi <i>et al.</i>	(HRS Collab.)
ADLER	88	PR D37 2023	J. Adler <i>et al.</i>	(Mark III Collab.)
ADLER	88C	PRL 60 89	J. Adler <i>et al.</i>	(Mark III Collab.)
ALBRECHT	88G	PL B209 380	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ALBRECHT	88I	PL B210 267	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ANJOS	88C	PRL 60 1239	J.C. Anjos <i>et al.</i>	(FNAL E691 Collab.)
BORTOLETTO	88	PR D37 1719	D. Bortoletto <i>et al.</i>	(CLEO Collab.)
Also		PR D39 1471 (erratum)	D. Bortoletto <i>et al.</i>	(CLEO Collab.)
HAAS	88	PRL 60 1614	P. Haas <i>et al.</i>	(CLEO Collab.)
RAAB	88	PR D37 2391	J.R. Raab <i>et al.</i>	(FNAL E691 Collab.)
ADAMOVICH	87	EPL 4 887	M.I. Adamovich <i>et al.</i>	(Photon Emulsion Collab.)
ADLER	87	PL B196 107	J. Adler <i>et al.</i>	(Mark III Collab.)
AGUILAR-...	87E	ZPHY C36 551	M. Aguilar-Benitez <i>et al.</i>	(LEBC-EHS Collab.)
Also		ZPHY C40 321	M. Aguilar-Benitez <i>et al.</i>	(LEBC-EHS Collab.)
AGUILAR-...	87F	ZPHY C36 559	M. Aguilar-Benitez <i>et al.</i>	(LEBC-EHS Collab.)
Also		ZPHY C38 520 (erratum)	M. Aguilar-Benitez <i>et al.</i>	(LEBC-EHS Collab.)
ALBRECHT	87K	PL B199 447	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
BARLAG	87B	ZPHY C37 17	S. Barlag <i>et al.</i>	(ACCMOR Collab.)
BECKER	87C	PL B193 147	J.J. Becker <i>et al.</i>	(Mark III Collab.)
Also		PL B198 590 (erratum)	J.J. Becker <i>et al.</i>	(Mark III Collab.)
PALKA	87	PL B189 238	H. Palka <i>et al.</i>	(ACCMOR Collab.)
RILES	87	PR D35 2914	K. Riles <i>et al.</i>	(Mark II Collab.)
BAILEY	86	ZPHY C30 51	R. Bailey <i>et al.</i>	(ACCMOR Collab.)
BEBEK	86	PRL 56 1893	C. Bebek <i>et al.</i>	(CLEO Collab.)
LOUIS	86	PRL 56 1027	W.C. Louis <i>et al.</i>	(PRIN, CHIC, ISU)
ALBRECHT	85B	PL 158B 525	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ALBRECHT	85F	PL 150B 235	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
AUBERT	85	PL 155B 461	J.J. Aubert <i>et al.</i>	(EMC Collab.)
BALTRUSAIT...	85B	PRL 54 1976	R.M. Baltrusaitis <i>et al.</i>	(Mark III Collab.)
BALTRUSAIT...	85E	PRL 55 150	R.M. Baltrusaitis <i>et al.</i>	(Mark III Collab.)
BENVENUTI	85	PL 158B 531	A.C. Benvenuti <i>et al.</i>	(BCDMS Collab.)
ADAMOVICH	84B	PL 140B 123	M.I. Adamovich <i>et al.</i>	(CERN WA58 Collab.)
DERRICK	84	PRL 53 1971	M. Derrick <i>et al.</i>	(HRS Collab.)
SUMMERS	84	PRL 52 410	D.J. Summers <i>et al.</i>	(UCSB, CARL, COLO+)
BAILEY	83B	PL 132B 237	R. Bailey <i>et al.</i>	(ACCMOR Collab.)
BODEK	82	PL 113B 82	A. Bodek <i>et al.</i>	(ROCH, CIT, CHIC, FNAL+)
FIORINO	81	LNC 30 166	A. Fiorino <i>et al.</i>	
SCHINDLER	81	PR D24 78	R.H. Schindler <i>et al.</i>	(Mark II Collab.)
TRILLING	81	PRPL 75 57	G.H. Trilling	(LBL, UCB) J
ASTON	80E	PL 94B 113	D. Aston <i>et al.</i>	(BONN, CERN, EPOL, GLAS+)
AVERY	80	PRL 44 1309	P. Avery <i>et al.</i>	(ILL, FNAL, COLU)
ZHOLENTZ	80	PL 96B 214	A.A. Zholents <i>et al.</i>	(NOVO)
Also		SJNP 34 814	A.A. Zholents <i>et al.</i>	(NOVO)
		Translated from YAF 34 1471.		
ABRAMS	79D	PRL 43 481	G.S. Abrams <i>et al.</i>	(Mark II Collab.)
ATIYA	79	PRL 43 414	M.S. Atiya <i>et al.</i>	(COLU, ILL, FNAL)
BALTAY	78C	PRL 41 73	C. Baltay <i>et al.</i>	(COLU, BNL)
VUILLEMINT	78	PRL 41 1149	V. Vuillemin <i>et al.</i>	(Mark I Collab.)
GOLDHABER	77	PL 69B 503	G. Goldhaber <i>et al.</i>	(Mark I Collab.)
PERUZZI	77	PRL 39 1301	I. Peruzzi <i>et al.</i>	(Mark I Collab.)
PICCOLO	77	PL 70B 260	M. Piccolo <i>et al.</i>	(Mark I Collab.)
GOLDHABER	76	PRL 37 255	G. Goldhaber <i>et al.</i>	(Mark I Collab.)

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